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THE PLANT DISEASE REPORTER

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Supplement 61

Diseases of Vegetable and Field Crops (Other than Cereals)

In the United States in 1927

July 1, 1928.

BUREAU OF
PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

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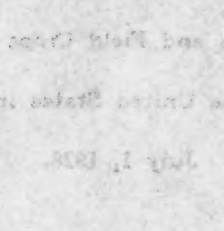

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

DISEASES OF VEGETABLE AND FIELD CROPS (OTHER THAN CEREALS)

IN THE UNITED STATES IN 1927

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Pathologist, Office of Vegetable and Forage Diseases,
Bureau of Plant Industry.

Plant Disease Reporter
Supplement 61.

July 1, 1928

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INTRODUCTION

This summary has been compiled from information furnished by the collaborators of the Plant Disease Survey. Not every State is represented, unfortunately. The conventional methods of reporting information are fairly uniform and necessarily brief. As a whole the data for 1927 is meager compared with other years.

The collaborators in each State are well known. Their names have not always been appended to each bit of information. Other people have made valuable contributions, particularly the personnel of the Office of Vegetable and Forage Diseases, Bureau of Plant Industry. Dr. L. L. Harter prepared the section on sweet potato diseases. But it is to the collaborators, their valuable information, lively interest, and continuous good will that the Plant Disease Survey is indebted for the foundation and structure of this summary.

DISEASES OF POTATO

LATE BLIGHT CAUSED BY PHYTOPHTHORA INFESTANS (MONT.) D BY.

The late blight of potato was unusually severe in the eastern States and New England. In some other States the initial conditions were right for the development of the disease in epidemic form, but changes in the weather suppressed it. The losses given (table 55) are estimates of the reduction in yield at harvest time, and take little account of the rots which are potential in storage. Careful, rigid selection is necessary that the losses in storage may not exceed those at harvest.

Potato - Late Blight

Table 55. Percentage losses from late blight of potato, as estimated by collaborators, 1927.

Percentage loss	States reporting	Percentage loss	States reporting
30	Massachusetts	2	California
25	Maine	1.5	New Jersey,
20	New York		North Carolina
10	Delaware	1	Virginia, Georgia,
5.1	Oregon		Minnesota
5	Maryland	0.5	Wisconsin
3	Connecticut	Trace	West Virginia,
			Indiana, Michigan

A few comments received from collaborators follow:

Massachusetts: Thirty per cent loss occurred in the unsprayed and poorly sprayed fields; properly sprayed fields lost 5 to 10 per cent; however, few were properly sprayed. (W. H. Davis)

Connecticut: Wet weather in August favored the development of the disease, and the delay in frost gave an opportunity for the blight to spread. (Clinton)

New Jersey: The early crop was unaffected, which means that the losses were not great. The disease was first observed on September 5 at Holmdale, showing one affected leaf per half-acre. Later it became very severe. The growers of the Red Skin variety have always regarded it as quite resistant, but the experience of the past year has convinced them that the variety is susceptible. (Martin)

Pennsylvania: The disease extended into Chester and Lancaster Counties, where it has seldom been found before. Losses of 50 per cent and more were common. Some were a total loss. (Thurston and Nixon)

Delaware: First heavy infection for over seven years. Confined to New Castle County. (Adams).

Maryland: Disease severe in entire western part of State. Jersey Red Skin vines only slightly affected, but tuber infection as high as 25 per cent. (Jehle)

Virginia: Severe in late crop of Idaho Red. One-third loss in spite of dusting. (Fromme)

West Virginia: A midseason start in scattered localities was checked by a hot dry spell. (Sherwood)

Potato - Late Blight

Southern Georgia: The disease appeared only in the second crop in the higher altitudes. (Boyd)

Wisconsin: A good start was checked by drought. (Vaughan)

Oregon: Very heavy loss from rot in section west of mountains. In some fields loss as high as 100 per cent. (McKay)

Recent literature

1. Alcock, N. L. Early manifestations of potato blight (Phytophthora infestans De Bary). Ann. Appl. Biol. 14: 440-441. Nov. 1927.
   Apparently healthy potatoes sprouted in the laboratory showed probable primary infection with P. infestans on the sprouts; also secondary infection. (In an experiment for potato wart.)

2. Ducomet, V. Le mildiou de la pomme de terre. Grande Rev. Agr. 1927: 135-136. Dec. 1927.
   Ligue nationale de lutte contre les ennemis des cultures, reunion de 17 novembre.

3. Lunden, A. P. Sammenligning av potetsorter pa forsøksgarden og pa spredte felter i arene 1918-26. Meld. Norges Landbruks. 7: 503-524. 1927.
   English summary: pp. 523-524.
   Potato varieties resistant to late blight.

4. Murphy, P. A. The production of the resting-spores of Phytophthora infestans on potato tubers. Sci. Proc. Roy. Dublin Soc. n. s., 18: 407-412. May 1927.
   Abst. Rev. Appl. Myc. 7: 51, Jan. 1928.

5. Murphy, P. A., and R. McKay. Some further cases of the production of diseased shoots by potato tubers attacked by Phytophthora infestans, and a demonstration of alternative sources of foliage and tuber infection. Sci. Proc. Roy. Dublin Soc. n. s., 18: 413-422. June 1927.
   Abst. Rev. Appl. Myc. 7: 52, Jan. 1928.

6. Perret, C. Quelques remarques a propos du mildiou de la pomme de terre. Rev. Path. Veg. & Entom. Agr. 14: 30-33. Jan./Mar. 1927.

7. Szymanek, J. Quelques observations sur la morphologie du mycelium et des sucoirs du Phytophthora infestans dans le tubercule de pomme de terre. Compt. Rend. Acad. Sci. Paris 184: 620-622. Mar. 7, 1927.

EARLY BLIGHT CAUSED BY ALTERNARIA SOLANI (ELL. & MART.) JONES & GROUT

Early blight was generally distributed throughout the country, but did very small damage to the crop. The first appearance of the disease was usually late. In Maryland R. A. Jehle reported:

> "Generally prevalent on all varieties, but more particularly on the Jersey Redskin. Most fields of this variety showed practically all plants affected but the damage was not serious."

R. E. Vaughan, Wisconsin, found the susceptible varieties to be Ohio and Bliss Triumph.

R. W. Goss, Nebraska, reported that early blight started in the western irrigated sections about the middle of August and was severe by September first. In these sections the vines were killed in about two to three weeks with a resultant loss of about 20 per cent. The disease was severe also in early planted dry-land fields.

Recent literature:

Gratz, L. O., and R. Bondo. Infection of potato tubers by Alternaria solani in relation to storage conditions. Florida Agr. Exp. Sta. Bul. 187: 167-182. June 1927.

SCAB CAUSED BY ACTINOMYCES SCABIES (THAX.) GÜSSOW

Common scab was general throughout the potato-growing sections, the amount developing during the season being close to the average. While this disease is yielding to seed treatment, in some sections seasonal conditions have favored its development. Scab may be regarded more as a market than as a production disease. It is of more importance in times of large crops when careful sorting must be resorted to if a salable product is to be secured.

Some of the principal losses appear in table 56.

Table 56. Percentage loss in grade of potatoes on account of scab. 1927.

Percentage loss	States reporting	Percentage loss	States reporting
5	New York, Michigan, Iowa, Oregon	3	North Carolina
3.5	New Jersey	2	Maryland, Wisconsin, Missouri, California

The comments of some collaborators are as follows:

Massachusetts: Some fields, very severe. (W. H. Davis)

New Jersey: This disease is much less prevalent than five years ago. A large number of the potato growers are now using only 50 pounds of nitrate of soda in their fertilizer mixture. The more extensive use of sulfate of ammonia has helped reduce the amount of scab. Scab-control studies this past year again showed the value of the organic mercury dips and likewise indicated that good results in the control of scab will follow the addition of the organic mercury compounds to the fertilizer. (W. H. Martin)

Delaware: Infection unusually heavy in early crop; general in late crop. (Adams)

West Virginia: Apparently the season did not favor the development of scab, even in local sections where it is usually very troublesome. (Sherwood)

North Carolina: Of increasing importance in early crop sections. Several fields observed this year with more than half the tubers seriously affected. (Fant)

Iowa: The unusual prevalence and destructiveness of common scab on Irish potatoes this year has caused some concern among potato growers as well as among many other people interested in the potato crop. Various ideas have been advanced as to the reasons for this epidemic, none of which seem to explain the situation adequately.

Scab is influenced to a marked extent by soil moisture. Dry soils favor scab while moist or wet soils are unfavorable to scab infection. The season of 1927 has supplied these favorable conditions to a marked degree because in the first place it has been very dry over the State as a whole, and a dry soil always has a higher temperature than a wet soil, provided other factors are the same in each case. (Archer)

Recent literature:

1. Duff, G. H., and Catherine G. Welch. Sulphur as a control agent for common scab of potato. Phytopath. 17: 297-314. May 1927.

2. Martin, W. H. Potato scab control with organic mercury compounds. Proc. Potato Assoc. Amer. 13: 74-81. 1927.

3. Millard, W. A., and C. B. Taylor. Antagonism of micro-organisms as the controlling factor in the inhibition of scab by green-manuring. Ann. Appl. Biol. 14: 202-216. 1927.
Actinomyces praecox, a saprophyte, has an inhibitory effect upon A. scabies when associated with it. The benificial effect of green manuring may be due to a similar competitive action.

4. Sanford, G. B. Important soil-borne diseases of crops in Western Canada. Scient. Agric. 7: 292-294. 1927.

5. Schlumberger, O. Die wirtschaftliche Bedeutung des Kartoffelschorfes. Ziele und Wege zu seiner Bekämpfung. (The economic importance of potato scab. Objects and methods of its control.) Illus. Landw. Zeit. 47: 131-132. 1927.

BLACKLEG CAUSED BY BACILLUS PHYTOPHTHORUS APPEL

The blackleg disease yielded well to seed treatments and elimination by seed-certification methods. No reports were received from a number of States, while in a few there was only a trace. The States in which 1 per cent or more was found are shown in table 57.

Table 57. Losses of 1 per cent or more due to blackleg of potato, 1927.

Percentage loss	States reporting	Percentage loss	States reporting
5	Kansas, Oklahoma	1.5	North Carolina, Iowa
3	Minnesota	1	Virginia, West Virginia, Michigan, Wisconsin, Oregon
2	Maine		

The comments received from collaborators, with one exception, trace the disease to defective seed.

New Jersey: Found only in seed potatoes from two northern seed-growing sections. (W. H. Martin)

Pennsylvania: Some few fields as high as 25 per cent. Mostly on imported seed of Cobbler and Russet varieties. (Thurston and Nixon).

Delaware: Generally observed with early crop. (Adams)

West Virginia: Much more. Wet, cool weather prevailed during growing season, and more infected northern seed than usual was used. (Sherwood)

Indiana: Present in early crop. Worse in Red River Valley than in home-grown seed. (Gardner)

Wisconsin: More than ever before noted. Especially severe on Irish Cobbler. Very little on other varieties. (R. E. Vaughan)

Potato - Blacklog

Iowa: Blacklog was widely distributed, especially in home gardens. It has been well determined that the use of certified seed and seed-piece treatment are quite effective in the control of the disease. The disease was common in fields planted with northern-grown seed, while in one or two fields of home-grown seed there were only a few infected plants. (Archer)

Nebraska: Infection general all over State, up to 5 to 10 per cent in eastern and central portions. Over 0.5 per cent in dry-land fields. Few fields showing 3 per cent in seed stocks free from blackleg for last seven years planted on land which had never grown potatoes. (Goss)

Kansas: In addition to the early infection there was a high percentage of late infection. (Elmer)

Oregon: Moisture appears to favor prevalence of disease. (McKay)

Recent literature:

1. Leach, J. G. The nature of seed-piece transmission of potato blackleg. Phytopath. 17: 155-160. Mar. 1927.

2. Racicot, H. N. Does blackleg overwinter in apparently healthy potato tubers? Proc. Potato Assoc. Amer. 13: 72-74. 1927.

STEMROT AND SCURF CAUSED BY CORTICIUM VAGUM BERK. & CURT (RHIZOCTONIA SOLANI KÜHN)

Rhizoctonia continued to be one of the widespread and destructive potato diseases. While it is more severe in the northern potato growing sections, good potato farm practice everywhere recommends that the seed tubers be treated for this disease.

In Onondaga County, New York, D. D. Ward found Rhizoctonia injury more severe than for several years. In New Jersey, W. H. Martin observed that this disease was again the cause of serious losses in a number of fields. Studies showed that stemrot was more severe in dry than in wet soils, and with deep rather than shallow planted seed pieces. Jehle in Maryland found it very severe on Jersey Redskins. Sherwood in West Virginia considered the wet cool spring to be a contributing factor. In Kentucky, according to J. S. Gardner, the early crop outgrew the injury, but the late crop was affected by stemrot, which was very unusual. Fant, in North Carolina, found stemrot of common occurrence in the early crop. In southern Georgia, according to Boyd, it was too hot and dry for the disease. In Missouri Rhizoctonia was widespread, with much loss in yield (5 per cent). In the western Nebraska commercial fields there was no sprout injury, but later there developed severe girdling and little potatoes in every field, sometimes as much as 50 per cent. In Kansas (Elmer) there was more of the disease than usual, due, apparently, to the cool, wet summer. In Colorado the potatoes in the mountain sections were affected, in some cases

severely, and in Utah it was more destructive than usual. In Oregon, McKay regarded the disease as the worst parasitic trouble affecting the potato. Short rotations may be partly responsible in some fields, but even with seed treatment and proper rotation, it may still be regarded as the most prevalent potato disease in the State.

The disease was general where it was found and while there were no outstanding losses, it was fully as important as in the average year. The losses in yield in percentage of the total for the States are noted in table 58.

Table 58. Percentage losses from stemrot and scurf of potato as estimated by collaborators, 1927.

Percentage loss	States reporting	Percentage loss	States reporting
10	Kentucky	1.5	Montana
8	Oregon	1	Virginia, Michigan
6	Iowa, Missouri	0.6	Mississippi
5	New York, Maryland, Minnesota	0.5	Idaho
		0.1	Tennessee
4	North Dakota	Trace	Massachusetts, Georgia, Florida, West Virginia
3	New Jersey, Utah, California		
2	Maine, North Carolina, South Carolina, Wisconsin		

Recent literature:

1. MacMillan, H. G., and A. Christenson. A study of potato seed treatment for Rhizoctonia control. Wyoming Agr. Exp. Sta. Bul. 152: 57-67. Mar. 1927.

2. Raeder, M. M., and C. W. Hungerford. Seed treatment control of Rhizoctonia of potatoes in Idaho. Phytopath. 17: 793-814. Dec. 1927.

3. White, R. P. The efficiency of organic mercury compounds for the control of Rhizoctonia on potato. Proc. Potato Assoc. Amer. 13: 81-97. 1927.

WILT CAUSED BY FUSARIUM SPP.

The losses due to Fusarium oxysporum were unusually low, no State reporting more than an average amount, and many none at all. The disease was not severe except locally. Traces were indicated as appearing in Massachusetts, New York, Delaware, Kentucky, Georgia, Mississippi, Wisconsin, Kansas, Idaho, and Oregon. In Maryland the loss was said to be 1 per cent, in Virginia 3 per cent, North Carolina 2 per cent appearing locally, while Oklahoma developed 7 per cent. In

Michigan the midseason drought was favorable for the development of 1 per cent, while in Missouri about 2 per cent loss occurred in stored potatoes. North Dakota reported 1.5 per cent, and Montana 3 per cent. In Colorado the disease was general, with a loss of 10 per cent. The disease was not serious in Utah, averaging only 1 per cent.

WILT AND STEM-END ROT CAUSED BY FUSARIUM EUMARTII CARPENTER

This disease is recorded from Nebraska. In 1927 there was very little wilt in the field, but considerable stem-end rot appeared in the bin. The disease was more severe in eastern Nebraska than usual. Cobblers are more susceptible than Triumphs. (Goss)

BACTERIAL WILT CAUSED BY BACTERIUM SOLANACEARUM EFS.

This disease caused very minor losses in 1927, being reported in only three States. In South Carolina the disease appeared in two localities, in small amount. In Georgia, it was found only in second crop potatoes in higher altitudes in north Georgia, especially, where potatoes followed potatoes or tomatoes. The maximum loss in any field was 5 per cent, and in the section around Cornelia only a trace was found. (Boyd). In Florida there was a total loss of 5 per cent, appearing late in the season when the potatoes were mature, and centering around Hastings. (Gratz)

MOSAIC (CAUSE UNDETERMINED)

The mosaic disease situation throughout the country shows a decided improvement over the previous year. A distinction is more generally made between the mild and rugose types. A number of States reported none of the disease observed, and in others the use of certified seed and other methods had reduced the amount to a negligible quantity. Where traces could be found it was not apparent that the losses in yield were appreciable. The widespread use of certified seed is having a telling effect on the amount of mosaic observed.

The comments of some collaborators follow:

Mild Mosaic

Massachusetts: Found in each field visited. (Davis)

New Jersey: Much more prevalent than rugose, but probably not the cause of serious losses. (Martin)

Table 59. Percentage losses from mosaic of potato, both mild and rugose, as estimated by collaborators, 1927.

Percentage loss	States reporting	Percentage loss	States reporting
20	Mississippi	3	New York, New Jersey
15	Montana	2	Indiana
10	Utah	1	Michigan, Wisconsin,
8	Oklahoma, Idaho		Minnesota, North
6	Oregon, California		Dakota, Tennessee
5	Massachusetts,	0.5	Connecticut, Delaware
	Maryland, North	Trace	Virginia, South Caro-
	Carolina		lina, Georgia, Iowa,
4	Maine		Missouri, Colorado

Maryland: Use of certified seed combined with increase in production of Jersey Red Skin variety and decrease in production of McCormick variety has greatly reduced losses from mosaic. (Jehle)

Tennessee: Especially bad on uncertified Bliss Triumphs. (McClintock)

Michigan: Symptoms were masked on Rurals in lower Michigan. (Kotila)

Wisconsin: Tuber indexing giving good results. (Vaughan)

Rugose Mosaic

New Jersey: This type of mosaic seldom found in certified seed. (Martin)

Pennsylvania: Very prevalent as usual. Probably the worst of the mosaic type, but not a great factor in yield. (Thurston & Nixon)

North Carolina: Very prevalent in early crop Irish Cobblers. (Fant)

Kansas: Prevalence varies greatly in different fields. Seed stocks were grown in northern States. (Elmer)

Utah: One of the most generally destructive diseases in Utah. (Linford)

Recent literature:

1. Blodgett, F. M. Tobacco mosaic on potatoes. Phytopath. 17: 727-734. Oct. 1927.

2. Johnson, James, The properties and behavior of potato rugose mosaic. (Abstract). Phytopath. 18: 141. Jan. 1928.

3. Murphy, P. A., and R. McKay. Investigations on the leaf-roll and mosaic diseases of the potato. Jour. Dept. Lands and Agric. Ireland 26: 295-305. 1927.

4. Smith, Kenneth M. Observations on the insect carriers of mosaic disease of potato. Ann. Appl. Biol. 14: 113-131. Feb. 1927.

5. Southwell, H. Virus diseases of potatoes and the raising of seed potatoes in the Irish Free State. Jour. Min. Agric. Great Britain 24: 19-25. 1927.

LEAF ROLL (CAUSE UNDETERMINED)

Leaf roll seems not to have been as severe in 1927 as in previous years. It is accompanied by well recognized symptoms, and is being rapidly eliminated from the better seed stocks. A number of States failed to report the disease, indicating in a measure its non-importance. From a few others the comments of collaborators are instructive.

New York: Nassau County - Runs as high as 12 per cent in New York stock, but in Maine seed it is considerably lower. (Hambleton)
Onondaga County - More prevalent than last year. (Ward)

New Jersey: In such varieties as the Red Skin nearly every field showed large numbers of diseased plants. (Martin)

Pennsylvania: Has been decreasing for some time. (Thurston and Nixon)

Kentucky: Abundant in uncertified seed. (Valleau)

Ohio: Prevalent in fields from uncertified seed. (Tilford)

Utah: Occurs wherever potatoes are grown in Utah. (Linford)

Oregon: A serious factor in eastern Oregon. (McKay)

Table 60. Percentage losses from leaf roll of potato, as estimated by collaborators, 1927.

Percentage loss	States reporting	Percentage loss	States reporting
25	Kentucky	1.5	Maryland
5	Massachusetts, New Jersey, Mississippi	1	Maine, Michigan
		0.5	Delaware
4	Indiana, California	Trace	Virginia, Minnesota, Iowa, North Dakota
3.5	New York		
2	North Carolina, Oklahoma, Utah, Idaho, Oregon		

Recent literature:

1. Murphy, P. A., and R. McKay. See Mosaic.

2. Schander, R. Physiologische Untersuchungen an blattrollkranken Kartoffeln. Landw. Versuchs-Stat. 105: 198-204. 1927.

3. Whitehead, T. Experiments on the control of potato leafroll. Welsh Jour. Agr. 3: 169-180. Jan. 1927.

SPINDLE TUBER (CAUSE UNDETERMINED)

Either this disease has declined rapidly in the better seed stocks or seasonal conditions prevented its detection in the field, for the amount reported was less than in previous years. In New York it was state wide but found only as a trace to 0.5 per cent. In Nassau County Hambleton found 23 per cent in a plot of Maine certified Cobblers as compared to 1 per cent in the Maine Green Mountains. Martin, in New Jersey, found it present in all the potato-growing sections, but not severe, the total loss being 1.5 per cent. Gratz in Florida found about 2 per cent in the field. In Minnesota it occurred locally on the Early Ohio and Irish Cobbler varieties. The disease is rare in Iowa (Archer), but general in Nebraska (Goss), where it was difficult to detect in the field, but appeared in the bin. In Kansas the imported seed brought in 2 per cent (Elmer), and in Utah (Linford) it continued to be observed. As a whole the disease appears to have been of minor importance in the country.

Recent literature:

1. Goss, R. W. Transmission of potato spindle-tuber by grasshoppers (Locustidae). Abstract. Phytopathology, 18: 140. Jan. 1928.

2. Werner, H. O. Identifying spindle-tuber in the field. Amer. Potato Jour. 4: 89-90. Aug. 1927.

WITCHES' BROOM (CAUSE UNDETERMINED)

This disease was observed affecting only one or two plants in Florida (Gratz), but appeared to be more common in Michigan, the yield being reduced by a trace, and one field showing as much as 30 per cent (Kotila), and a similar situation occurred in Oregon (McKay). In Idaho there were a few scattered infestations, but there were no reports of it in Washington.

Recent literature:

Young, P. A. Transmission of potato witches' broom to tomatoes and potatoes. Science 66: 304-306. Sept. 30, 1927.

CALICO (CAUSE UNDETERMINED)

Traces of calico were seen in Cache, Salt Lake, Utah, and Millard counties, Utah, according to Linford. No other State reported this disease in 1927.

YELLOW DWARF (CAUSE UNDETERMINED)

This disease is reported only from New York State, where the total loss due to it was only a trace, and the maximum amount of infection in any one field was 15 per cent.

TIPBURN AND HOPPERBURN

Tipburn and hopperburn have again assumed serious proportions as a disease of the potato. Mississippi, Louisiana, and Michigan, had decided increases in the amount, while some other States, notably New York, West Virginia, Kentucky, and Iowa, suffered severely.

The losses suffered are shown in table 61.

Table 61. Percentage losses from tipburn and hopperburn of potato, as estimated by collaborators, 1927.

Percentage loss	States reporting	Percentage loss	States reporting
30	Kentucky	2	Tennessee, North Dakota
20	West Virginia	1.5	North Carolina
15	Iowa	1	Maine, Massachusetts, Delaware, Virginia, Missouri
10	New York, Minnesota	Trace	Maryland, Oregon
5	Michigan, Colorado		
4	New Jersey, Mississippi		
3	Georgia		

Recent Literature:

1. Rosen, H. R. A preliminary report on the relationship of insect barriers to the development of tip and margin burn of Irish potatoes. (Abstract) Phytopath. 18: 141. Jan. 1928.

2. Tilford, P. E. The superiority of freshly mixed copper-lime dust for the control of potato hopperburn. Proc. Potato Assoc. Amer. 13: 70-72. 1927.

MISCELLANEOUS PARASITIC DISEASES

Armillaria mellea (Vahl) Quel. California.

Botrytis sp. (cinerea ?). A Botrytis was isolated from stored potatoes in Maine. (Folsom)

Caconema radicicola (Greef) Cobb. Boyd, in Georgia, reported this disease unusually common in the first potato crop of the Coastal Plain and still more severe in the fall crop on the Plain and in the mountain sections. California; local, 4 per cent (Milbrath) Texas.

Macrophoma sp., probably M. phaseoli Maubl. (See bean). Georgia: This disease caused 50 per cent tuber rot in one small patch near Thomasville. A trace of what was considered to be the sterile, Sclerotium, stage, was found in July in fields at Cornelia. (Boyd).

Phoma tuberosa Molhus, Rosenbaum, & Schultz, seed-piece rot. Maine: On cut surfaces of seed pieces. (Schultz and Folsom).

Phymatotrichum omnivorum (Shear) Dug., causing the Texas root rot, was again reported from south Texas. (Taubenhaus).

Potato - Miscellaneous parasitic diseases

Sclerotium rolfsii Sacc. was common in Georgia, in both the first and second crops, causing sudden wilting and death any time after the plants were one third grown (Boyd). In Florida several affected plants were observed, but the losses were small. In southern Texas the disease was prevalent.

Spondylocladium atrovirens C. O. Harz. Silver scurf was statewide in New York, but caused little loss (Chupp). In Virginia it was unusually abundant (McWhorter). In New Jersey it was generally distributed, being abundant on the late crop (Martin). Goss reports it for the first time in Nebraska, in experimental plots at North Platte. It was found on Irish Cobblers grown in Indiana at the Potato Show at Purdue University (Gardner)

Thielavie basicola (B. & Br.) Zopf., black root rot, caused the dwarfing of potato plants in Suffolk County, New York.

Verticillium alboatrum Reinke & Berth. Martin, New Jersey, reports a case where potatoes were wilted on land on which eggplants had been severely wilted for three years. In Utah the disease is still confused with Fusarium, though Linford reports a total loss of 0.5 per cent due to this cause.

Recent Literature:

1. Paintin, Ruth Davis. Notes on the parasitology of Sclerotium rolfsii. Mycologia 20: 22-26. Jan.-Feb. 1928.

2. Weiss, F., J. I. Lauritzon and P. Brierley. Investigations of potato storage rots in 1925-26 at the Marble Laboratory, Inc., Canton, Pa. Proc. Potato Assoc. Amer. 13: 108-112. 1927.

3. Wollenweber, H. W. Die Wirtelpilz-Welkekrankheit (Verticilliose) der Kartoffel. (The whorl fungus wilt disease (verticilliosis) of the potato.) Biol. Reichsanst. für Land und Forstwirtsch. Flugbl. 84. 4 pp. 1927.

MISCELLANEOUS NON-PARASITIC DISEASES AND INJURIES

Black heart. New Jersey: Several reports of this trouble, probably due to high storage temperatures. (Martin). California: Trace (Milbrath)

Heat necrosis. California: local, 0.5 per cent (Milbrath)

Hollow heart. New York: Found in many oversized tubers where a high yield was obtained in Suffolk County (Sinden). Idaho: Caused 0.5 per cent total loss (Hungerford).

Internal browning. California and localized, 5 per cent (Milbrath).

Internal brown spot. Michigan: Due to drought and high soil temperature, a trace of this trouble developed in local areas. (Kotila). Washington.

Potato - Non-parasitic Diseases

Lightning injury occurred once in Connecticut, and in a few scattered cases in Cortland County, New York. The losses were slight.

Nut grass (Cyperus sp.) tuber formed inside of potatoes, New Jersey.

Sprout tuber.North Carolina. Severe in early crop planted from Canadian seed. A small tuber formed on end of the shoot which normally should have developed into the aerial portion of the plant (Lehman). Also reported from Virginia and South Carolina.

Recent literature:

1. Holland: Blue coloration in potato tubers. Intern. Rev. Agr. n. s., 18: 566T-567T. Oct. 1927. Lack of potash in soil.

2. Botjes, J. O., and W. B. L. Verhoeven. Het blauw worden van aardappelen. (The blue discoloration of potatoes.) Tijdschr. Plantenz. 33: 57-96. Apr. 1927.

3. Evans, A. T. Delayed dormancy as a probable cause of uneven stands in planted potatoes. Amer. Jour. Bot. 14: 284-286. May 1927.

4. Gilbert, A. H. Net necrosis of the potato. Phytopath. 17: 555-561. Aug. 1927.

5. Moore, H. C. Hollow heart in potatoes. Papers Michigan Acad. Sci. 6: 289-294. 1927.

6. Moore, H. C. Hollow heart of potatoes. A report of experiments conducted in 1926. Proc. Potato Assoc. Amer. 13: 180-182. 1927.

7. Warner, H. O. The hollow heart situation in the Russet Rural potato. Proc. Potato Assoc. Amer. 13: 45-51. 1927.

8. Weiss, F., and P. Brierley. The occurrence of sprout tubers and some factors relating to their development. Proc. Potato Assoc. Amer. 13: 33-42. 1927.

9. Wright, R. C., and H. C. Diehl. Freezing injury to potatoes. U. S. Dept. Agr. Techn. Bull. 27: 1-23. Oct. 1927.

DISEASES OF TOMATO

LEAFSPOT CAUSED BY SEPTORIA LYCOPERSICI SPEG.

The amount of leafspot reported in the country is decidddly less than last year, and probably averaged very low. In Missouri the disease was of great importance, causing a large loss. Several other states, while reporting losses, did not find them of serious consequence.

The losses by states are shown in table 62.

Table 62. Percentage losses from Septoria blight of tomato, as reported by collaborators. 1927.

Percentage loss	States reporting	Percentage loss	States reporting
10	Missouri	2	New York, Arkansas
6	New Jersey, Indiana	1	Maryland
	Kansas	0.5	Delaware, Georgia,
5	Iowa		Minnesota

The comments received from collaborators follow:

New York: (Monroe County) Serious amounts in many fields. (Coombs)

(Suffolk County). Earliana and Bonny Best plants grown beside affected plants entirely free from disease (Lindon).

New Jersey: In one section severe on Baltimore, but not on Marglobe. (Martin)

Arkansas: Common in south and central parts causing considerable leaf injury. (Young)

Indiana: Abundant evidence of importation on Texas-grown plants. Good control with copper-lime dusts, with 30 to 60 per cent increase in yield and improved color. (Gardner)

Iowa: Early varieties in Muscatine County severely attacked. Late varieties escaped infection. (Archer)

Missouri: Worst year in history of tomato growing - many plants showed foliage to be completely riddled. Occurred early and spread so rapidly that plants were badly injured before coming into bearing. (Scott)

Kansas: Unusually severe during 1927 season. (Elmer)

Colorado: Present in most fields, not important. (Le Clerg)

EARLY BLIGHT CAUSED BY ALTERNARIA SOLANI (ELL. & MART.) JONES & GROUT

The disease was common throughout the eastern tomato sections, extending well south along the Atlantic States. More than usual was reported from the Mississippi Basin, Tennessee being especially hard hit. No western state reported the disease. A single report from Mexico indicates its very great severity there. Losses reported are shown in table 63.

Table 63. Percentage losses from early blight of tomato, as estimated by collaborators, 1927.

Percentage loss	States reporting	Percentage loss	States reporting
20.0	Tennessee	2.0	Delaware, Missouri
7.0	Maryland	1.0	Connecticut, New Jersey, North Carolina, Ohio, Indiana
5.0	Virginia, Georgia, Mississippi	Trace	Maine, Massachusetts, New York, West Virginia, South Carolina, Wisconsin, Minnesota, Kansas

The disease affected the plant differently, as will be noted in the comments from collaborators:

Connecticut: Injurious to lower leaves. (Wilkinson)

New York: Considerable among the vines, but growers welcome its presence as a factor hastening ripening. (Linden)

Maryland: The common leaf blight this year. (Norton)

Virginia: The cause of fruit drop. (McWhorter) Severe at Danville, causing nailhead spot. (Fromme)

Tennessee: No resistant varieties.

North Carolina: Widely distributed throughout the state, causing damage to leaves and stems. No fruit infection observed. (Poole)

Georgia: The late crop ordinarily suffers. (Boyd)

Texas: Nailhead spot caused considerable loss in some plantings. (Bach)

Arkansas: Common but does not appear to cause much loss. (Young)

Indiana: Good control with copper lime dusts. Much stem end fruit invasion in September. (Gardner)

Missouri: Considerable fruit showed nailhead spots this season. (Scott)

Mexico: Varietal resistance is as follows: Comparatively immune, Marvelosa; very resistant, Marglobe; resistant, Norton and Stone; very susceptible, Globe. In a single variety test of infected fruits, Globe was 90 per cent, Marglobe 14 per cent, and Marvelosa 7 per cent. In many fields of Globe in February and March the loss in yield was 50 to 90 per cent. (A. W. Morrill)

FUSARIUM WILT CAUSED BY FUSARIUM LYCOPERSICI SACC.

There was a considerable reduction in the amount of wilt over previous years, which may be due partly to the extended use of resistant seed, and partly to more favorable growing conditions for the host. The disease was most severe in the lower Mississippi Valley States. In New Jersey and Maryland, in both of which the crop is of major importance, the losses were substantial. The percentage losses are indicated in table 64.

Table 64. Percentage losses from Fusarium wilt of tomato, as estimated by collaborators, 1927.

Percentage loss	States reporting	Percentage loss	States reporting
15.0	Arkansas	2.0	Virginia, Missouri,
13.0	Mississippi		Colorado, Texas
10.0	Oklahoma, Tennessee	1.5	Utah
6.0	Kansas	1.0	Ohio, South Carolina
5.0	New Jersey, Kentucky, North Carolina, Georgia	0.5	California
		Trace	Minnesota, Wisconsin, New York, Delaware,
4.0	Maryland		Iowa, West Virginia

Some of the reports from collaborators follow:

New Jersey: Marglobe very resistant. (Martin.

West Virginia: Season too moist to be favorable for disease. (Sherwood)

Kentucky: Becoming less prevalent. (J. S. Gardner)

North Carolina: Marglobe has generally given good results. (Poole and Fant)

Tomato - Fusarium Wilt

Arkansas: Very common except on new land. (Young)

Minnesota: Growers have stopped raising the very susceptible Bonny Best variety. (Sect. Plant. Path.)

Missouri: Cool summer seemed to inhibit wilt considerably. (Scott)

Recent literature:

1. Ludwig, C. A. Fusarium wilt of tomatoes. Notes on varietal resistance at Clemson College, South Carolina. U. S. Dept Agr. Plant Dis. Rep. 11: 123-124. 1927.

2. White, R. P. Studies on tomato wilt caused by Fusarium lycopersici Sacc. Jour. Agr. Res. 34: 197-239. 1927.

YELLOWS (WESTERN YELLOW BLIGHT OR CURLY TOP) (VIRUS)

There is appreciable improvement in this disease situation in the states reporting. The details appear in the reports of collaborators which follow:

New Mexico: A large amount.(Crawford)

Arizona: Observed in many of the plantings in the Salt River valley this season. (Arizona News Letter)

Utah: Crop of major importance, suffered a total loss of 6 per cent from the disease. Co-extensive with tomato culture in Utah. Forty-one fields examined in the five tomato canning counties showed an average count of 5.7 per cent affected plants, and many of these developed the disease after they had begun to produce. (Linford)

Idaho: Loss 5 per cent. (Hungerford)

Washington: Present to some extent whorever tomatoes are grown. (Dept. Plant Path.)

Oregon: The total reduction in yield was 25 per cent, with the maximum infection in any one field being 95 per cent. Very destructive in most sections east of the mountains. The one limiting factor to successful tomato production in four-fifths of the state. (McKay)

California: Total reduction in yield 10 per cent. Generally distributed over the state. Very severe in Stanislaus County. No fruits are produced if plants are diseased early. (Kondrick)

Tomato - Yellows

Recent literature:

1. Rosa, J. T. Chemical changes accompanying the western yellow blight of tomato. Plant Physiology 2: 163-169. No. 2, April 1927.

2. Severin, Henry H. P. Crops naturally infected with sugar beet curly top. Science n. s. 66: 137-138. Aug. 5, 1927.

MOSAIC (VIRUS)

Mosaic was very general in the states reporting it, but did not appear to be a serious or limiting factor in production. In Massachusetts it was more widespread than usual, and the infected plants ceased to yield. The disease was very general in Pennsylvania, Delaware, and New York and in some cases quite destructive. Maryland suffered a 3 per cent loss, West Virginia a trace, and Tennessee 5 per cent. In Ohio mosaic caused a greater loss in greenhouses than in the field, and in Indiana plants in greenhouses were likewise affected, its occurrence being correlated with aphid prevalence and with handling. The disease was not important in commercial plantings in Michigan. Scott reported that mosaic, of which filiform leaf was the most characteristic symptom and which may not be the true mosaic, was severe in several fields in the canning districts of southwestern Missouri, but the loss for the state was only a trace. In Kansas the shoe-string type only caused damage. The shoe-string type was noted in Wisconsin also. The disease was not regarded as severe in Utah, but caused a loss of 1 per cent. In Oregon most of the damage was caused in the greenhouses, with a loss in the field and house of a trace. It appeared wherever tomatoes were grown in California, reducing the yield by 1 per cent.

Recent literature:

1. Brewer, P. H., H. R. Kraybill, and M. W. Gardner. Purification of the virus of tomato mosaic. Phytopath. 17: 744. Oct. 1927.

2. Doolittle, S. P. Soil transmission of tomato mosaic and streak in the greenhouse. (Abst.) Phytopath. 18: 155, Jan. 1928.

3. Kraybill, H. R., and S. H. Eckerson. Tomato mosaic. Filtration and inoculation experiments. Amer. Jour. Bot. 14: 487-495. Oct. 1927.

4. Sorokin, H. Phenomena associated with the destruction of the chloroplasts in tomato mosaic. Phytopath. 17: 363-379. June 1927.

STREAK (VIRUS)

Only a few reports of this disease were received. In New York it appeared

to be general and a loss of 0.5 per cent was suffered. It appeared on a few farms in southern New Jersey and in two fields in north western Ohio, causing slight loss. In Indiana it was quite prevalent in greenhouses, but rarely found in fields. In Wisconsin a few greenhouses near Milwaukee contained diseased plants. It was reported from Iowa and Missouri for the first time, in both states being found in greenhouses. It was found sparingly in Utah in the field. In Oregon it was more severe than usual, but was confined to greenhouses, apparently. As a whole it appears much more serious in the greenhouse than in the field.

Recent literature:

1. Berkeley, G. H. Studies in tomato streak. Sci. Agr. 7: 210-223. Feb. 1927.

2. Gardner, M. W., and J. B. Kendrick. Potatoes - a virus disease menace to tomatoes. Hoosier Hort. 9: 5-8. 1927.

3. Simmonds, J. H. Spotted wilt of tomatoes. Queensland Agr. Jour. 28: 28-30. July 1927.

4. Stover, W. G. Experiments with tomato streak. (Abstract) Phytopath. 18: 154, Jan. 1928.

BACTERIAL WILT CAUSED BY BACTERIUM SOLANACEARUM EFS.

Bacterial wilt was observed in only a few states, causing on the whole, very small losses. A trace of the disease appeared in Massachusetts (in greenhouses only), Maryland, Virginia, Mississippi, Texas and Michigan, while 2.5 per cent loss is reported from North Carolina, 2 per cent from South Carolina, and 0.5 per cent from Georgia.

In Georgia more was observed than in previous years, especially in wet and poorly drained places. In Michigan occasional plants showing symptoms of this disease appeared only in fields from southern grown plants, according to Nelson, who stated that no attempt was made to confirm the diagnosis by cultural methods.

BACTERIAL CANKER CAUSED BY APLANOBACTER MICHIGANENSE EFS.

The bacterial canker, or Grand Rapids Disease as it is sometimes called, is being recognized more by pathologists. Two new states, Georgia and Utah, were added to its known range in 1927. In Massachusetts it was reported as serious in a number of greenhouses, with losses as high as 2 per cent. In Connecticut there were several reports, without estimates. In New York the disease was general, appearing in a large number (eight) of scattered counties, with an estimated loss of 0.5 per cent. In Georgia where the loss was 1 per cent, Boyd reported that the disease made headway in fields retarded by drought and poor transplanting methods, and was less severe in wet areas. Plants with mild

symptoms appeared to recover entirely after the drought was broken. In Michigan 5 per cent loss was suffered, the affected plants having been imported from the South. In some fields total infection was observed. The greatest loss, 12 per cent, was reported from Utah.

BACTERIAL SPOT CAUSED BY BACTERIUM VESICATORIUM DOIDGE

This disease appeared in slightly increased amounts in New York and Missouri, but the losses were only a trace. It occurred locally in Florida, but with no appreciable loss. The weather was too cool for its development in Indiana, and in Michigan it caused a slight loss, the southern grown plants being commonly affected. In the neighborhood of Muscatine, Iowa, the losses amounted to a trace, but it was not otherwise reported in the state.

CROWN GALL CAUSED BY BACTERIUM TUMEFACIENS EFS. & TOWNS.

Crown gall was reported occurring naturally only once in 1927, having been observed once in Chautauqua County, New York.

Recent literature:

1. Hill, J. Ben. The method and rate of migration of Bacterium tumefaciens in tomato. (Abstract) Phytopath. 18: 192, Jan. 1928.

BLOSSOM-END ROT, NON-PARASITIC

Thirty states reported this disease, eight of them as more severe than the average year. In 17 states the disease was recognized as being generally distributed. As a whole it was of serious proportions in 1927. Table 65 shows the percentage losses.

Table 65. Percentage losses from blossom-end rot of tomato, as estimated by collaborators, 1927.

Percentage loss	States reporting	Percentage loss	States reporting
5-10	Michigan	0.5	New Jersey,
5	Georgia, Mississippi, Missouri		Maryland, Ohio, California
3	North Carolina, Texas	Trace	Massachusetts, West
2	Tennessee, South Dakota		Virginia, Oklahoma,
1	Kansas		Iowa, Colorado,
0.5-1	New York		Idaho, Oregon
0.75	North Dakota		

LEAF MOLD CAUSED BY CLADOSPORIUM FULVUM CKE.

This disease was reported from fifteen states as causing losses to greenhouse tomatoes. The losses varied, in some states being regarded as severe, in others as nominal. It would appear from the remarks of collaborators that the greenhouse losses were associated directly with poor management of the house. In Georgia and North Carolina the disease was observed in the field. The greenhouse losses in Ohio were 0.5 per cent. The late spring crop in Michigan suffered generally, with slight losses. The losses in Wisconsin greenhouses amounted to 5 per cent, but the disease was not regarded as serious in the field, where Bordeaux copper lime dusts have proved of some value in control. In Florida, Tennessee, Kentucky, and Louisiana the disease was reported, apparently in the field, but no losses were specified.

Recent literature:

1. Jagger, I. C. Tomato mildew. Ann. Rept. Exp. and Res. Sta. Nursery and Mark. Gard. Industr. Devel. Soc. 12: 34. 1927.

2. Friebels, H. Die Bekampfung der Braunfleckenkrankheit bei Tomaten. Gartenwelt 31: 268-270. 1927.

OTHER DISEASES

Blossom drop. (non-par.) Texas: Very prevalent, causing 1 per cent loss. Illinois: Bloomington. Probably due to too much manure.

Botrytis sp. stem blight. New Jersey: Formed brownish stem lesions on nearly mature plants in greenhouse. (Dept. Plant Path.)

Cacoenema radicicola (Greef) Cobb, root knot. New York: (Suffolk County) Plants were stunted in one grower's hot frames. New Jersey: Present, apparently in greenhouse. South Carolina: Generally distributed. Georgia: 10 per cent total loss, with weather relations favorable. Mississippi: Jackson County. Texas: Prevalent, causing 0.5 per cent loss. Wisconsin: Causing considerable damage in Milwaukee greenhouses. Utah: occurs in Weber and Davis Counties. Also reported from Arizona and California.

Colletotrichum phomoides (Sacc.) Chester, anthracnose. General in New Jersey and Florida. Observed in Indiana at canning-factory receiving platforms.

Corticium vagum Berk. & Curt. (Rhizoctonia solani Kühn), fruit rot. New York: loss 1 to 5 per cent, widespread, caused by damping-off and wire stem. Virginia: greenhouse seedlings damped off in large numbers. Florida: present in usual amount, causing buckeye rot. Texas: present, causing soil rot. Utah: caused decay of ripening fruit in field.

Fruit rots. Missouri: 5 per cent loss. Much complaint made all over the state about rotting of fruit. Much was sunburned, and many rots were an aftermath of blossom end rot. Many species of fungi were isolated from market fruits, but Fusarium predominates. Wet summer with much fruit on the ground. (Scott).

Glomerella cingulata (Stoneman) Sp. and V. Sch. Maine: found on fruits in garden near old neglected apple trees.

Leafroll. (undet.) New York: caused 0.1 per cent loss on the Grant variety, in three producing districts.

Oospora lactis parasitica Pritchard and Porte. Florida: appears to be general.

Phoma destructiva Plowr. Maine: isolated from fruit ripening in storage. New Jersey: reported once, but probably general. Texas: Traces in southern part. California: in local areas causing 0.5 per cent loss.

Phymatotrichum omnivorum (Shear) Duggar. Texas root rot. Caused 1 per cent loss in Lamb County.

Phytophthora infestans (Mont.) D By. Late blight. Maine: unusually conspicuous. New York: trace. Found only when tomatoes were growing near blighting potatoes. In one case 10 per cent of the fruit was destroyed. Not observed on the foliage. California: general in late crop in coastal counties of Orange, Los Angeles, Ventura, with loss of 75 per cent.

Phytophthora terrestris Sherb., buckeye rot. Massachusetts: 10 per cent loss under glass at Woburn. Florida: general.

Potash hunger (non-par.) Indiana: occurs in dark loam soils in North Central portion.

Puffing (non-par.) Texas: prevalent, causing 1 per cent loss.

Rhizopus nigricans Ehr., black mold rot. California: general, causing 2 per cent loss.

Sclerotinia sclerotiorum (Lib.) Massee. Ohio: reported in greenhouses in Cleveland.

Sclerotium rolfsii Sacc., stem and fruit rot. Indiana: found locally on plants imported from Arkansas. South Carolina: reported causing a fruit rot.

Sunscald. (non-par.) Pennsylvania: newly set tomatoes underwent pronounced wilting.

Tip-burn. Ohio: occurred in and about Circleville.

Verticillium albo-atrum R. & Br., wilt. Massachusetts: common on trellised tomatoes at Waltham. California: local, trace. New York: Nassau County. A characteristic collar rot (?) was traced to the seed bed.

Recent literature:

1. Brittlebank, C. C. and S. Fish. A garden fungus disease. A wilt of tomatoes, Iceland poppies, and other garden plants in Victoria caused by the fungus Phytophthora cryptogea (Pethy. and Lafferty). Jour. Dept. Agr. Victoria 25: 380-381. 1927.

2. Drechsler, C. Two water molds causing tomato rootlet injury. Jour. Agr. Res. 34: 287-296. 1927.

3. McCubbin, W. A. and F. F. Smith. Rate of virus spread in tomato plants. Science n. s. 66: 486-487. 1927.

4. Simmonds, J. H. Irish blight of tomatoes. Queensland Agr. Jour. 28: 453-455. No. 5, Nov. 1927.

5. Small, T. Rhizoctonia "foot-rot" of the tomato. Ann. Appl. Biol. 14: 290-295. 1927.

6. Williams, P. H. Damping-off of tomatoes and cucumbers. Ann. Rept. Exp. & Res. Sta. Nursery & Mark. Gard. Industr. Devel. Soc. 12: (1926) 29-32. 1927.

7. Williams, P. H. Thielavia root rot of the tomato. Ann. Rept. Exp. & Res. Sta. Nurs. & Mark. Gard. Industr. Devel. Spc. 12 (1926) 126-29. 1927.

8. Young, P. A. Transmission of potato witches' broom to tomatoes and potatoes. Science n. s. 66: 304-306. 1927.

DISEASES OF SWEET POTATOES

Prepared by L. L. Harter

STEM ROT CAUSED BY FUSARIUM BATATATIS WOLL. AND F. HYPEROXYSPORUM WOLL.

Stem rot is widely distributed throughout the United States where susceptible varieties are grown. Compared with last year, there is little difference in the percentage of the disease, Missouri and Kansas being the only states to report a reduction. The percentage losses reported were as follows: New Jersey 14; Tennessee and North Carolina 10; Texas 1; Iowa 8, and California 5; Delaware, Virginia, Mississippi, Oklahoma, and Arkansas 3; Maryland, Georgia, Missouri, and Kansas 2. That this disease is capable of causing heavy losses is shown by the reports from New Jersey and North Carolina where 80 and 100 per cent respectively of the plants in individual fields became infected. The mortality was probably very high.

Martin of New Jersey reports a reduction in the percentage of infection and a corresponding increase in yields as a result of immersing the sprouts before planting in some of the organic mercury compounds. He also found that on infested soil the yield could be increased by planting two and three plants to the hill.

Sweet Potato - Stem Rot

Tho Yellow Yam, White Yam, Triumph, and Red Brazil varieties are reported as very resistant in North Carolina, while Nancy Hall, Porto Rico, and Yellow Jersey are very susceptible.

Harter and Whitney (2) reported that as a result of several years' tests of a number of commercial varieties on badly infested soil they found that while none of the varieties were entirely immune a number were sufficiently so to be grown with success on badly infested soil.

Recent literature:

1. Harter, L. L. and W. A. Whitney. Relation of soil temperature and soil moisture to the infection of sweet potatoes by the stem rot organisms. Jour. Agr. Res. 34: 435-441. 1927.

2. Harter, L. L. and W. A. Whitney. The comparative susceptibility of sweet potato varieties to stem rot. Jour. Agr. Res. 34: 915-919. 1927.

3. Martin, W. H. The value of more than one plant to each hill in reducing losses from stem rot. Proc. New Jersey State Hort. Soc. 52: 14-21. 1927.

4. Poole, R. F. Sweet potato stem rot prevented by treating stems and roots with Bordeaux mixture. (Abstract) Phytopath. 18: 152. 1928.

BLACK ROT CAUSED BY CERATOSTOMELLA FIMBRIATA (ELL. & HALS.) ELLIOTT

The distribution of black rot seems to be coincident with the growth of the sweet potato. During the past year an increase was reported from some states, which was probably due to neglect of the application of sanitary control measures, such as seed selection and seed disinfection. Delaware, Maryland, Virginia, New Jersey, Tennessee, North Carolina, Indiana, and Kansas reported an increase over last year while South Carolina reported a decrease. The percentage of black rot was reported by states as follows: Tennessee 20, Mississippi and Texas 5; New Jersey 4; Kentucky and Indiana 3; North Carolina, South Carolina, Iowa and Kansas 2; Georgia 0.5, and Maryland a trace.

McWhorter reported more black rot in the Norfolk section in the fall of 1927 than in 1925 and 1926 due probably to the carelessness of the farmers. Crawford found the disease prevalent in New Mexico on the slips and severe in storage. Boyd (1) reports poor control in 1927 in the plant beds when inoculated roots were treated with each of 16 different disinfectants.

Recent literature:

1. Boyd, O. C. Comparison of various disinfectants in the treatment of sweet potatoes for black rot control: A progress report. (Abstract) Phytopath. 18: 153. 1928.

SOIL ROT CAUSED BY ACTINOMYCES SP.
(formerly attributed to Cystospora batata).

Soil rot was reported from eight states as follows: New Jersey 1.5 per cent; Maryland 1.0; slight loss in Louisiana, Texas and Kansas; reported from Delaware, North Carolina, and Florida.

North Carolina: Found on Yellow Jersey in Currituck County - very slight infection observed on Porto Rico in Craven, Pamlico, and Carteret Counties (Poole).

New Jersey: While not generally severe, this disease was present in fields which had previously been limed. (Martin)

Maryland: Becoming more severe on Eastern Shore. (Jehle)

Recent literature:

1. Adams, J. F. An Actinomycete the cause of soil rot or pox in sweet potatoes. (Abstract) Phytopath. 18: 152. 1928.

SCURF CAUSED BY MONILOCHAETES INFUSCANS HALS.

Scurf is reported from fifteen states, the losses varying from a trace to 1.5 per cent. Valleau and Gardner reported the disease as severe all over the state of Kentucky. Scurf is a disease not generally regarded as causing severe losses or particularly difficult to control. The losses are confined largely to the reduction in the market price resulting from the objectional appearance of the potatoes and to shrinkage in storage.

W. H. Martin of New Jersey says: "Tests conducted this year showed the value of organic mercury compounds for disinfection of sweet potatoes", while R. F. Poole of North Carolina reports that recent control studies have indicated that this disease would be greatly reduced if potatoes free of scurf were used for growing sprouts.

FOOT ROT CAUSED BY PLEIODOMUS DESTRUENS HARTER

Foot rot was observed in only four states, namely Maryland, Florida, Virginia, and Mississippi, and in no case was more than a trace reported. McWhorter reported that foot rot is now comparatively rare in Virginia. This is in sharp contrast to its occurrence ten or more years ago when foot rot was so severe in the state as to threaten the industry. When this disease was first observed in Virginia as much as 90 per cent of the plants were infected and frequently the yield was reduced 75 per cent or more. Seed selection and the application of other control measures have almost exterminated this disease.

ROOT KNOT CAUSED BY CACONEMA RADICICOLA (GREEF) COBB

Root knot was reported from Tennessee, North Carolina, South Carolina, Georgia, Florida, and Arkansas. North Carolina reported a loss of 1.0 per cent. Georgia and Florida reported a trace. V. H. Young reported root knot as common and important in Arkansas.

Poole of north Carolina classifies some of the commercial varieties with respect to their susceptibility or resistance as follows: very resistant, Porto Rico and related strain, Yellow and Big Stem Jersey and related strains; resistant, Triumph; susceptible, Southern Queen, Yellow Yam, and others; very susceptible, Nancy Hall, General Grant, and Red Brazil.

MOSAIC (CAUSE UNKNOWN)

Mosaic was reported from only two states, Mississippi and Iowa. The reports indicate only a trace of infection and no loss from the disease. In Iowa it occurred only on the Nancy Hall. As a matter of fact there have been no authentic reports of mosaic on any variety of sweet potatoes except the Nancy Hall.

STORAGE ROTS, DUE TO VARIOUS ORGANISMS

Judging from the reports of collaborators, the losses in storage appear to be considerably less than in previous years, which may in part at least be attributed to the improved methods in harvesting and handling the crop and to better management of the storage houses. Rhizopus nigricans leads all other organisms in causing storage losses estimated in 1927 at 20 per cent in North Carolina, 5 per cent in Texas and California, and heavy in New Jersey. A trace was reported from Iowa. It was also reported from Mississippi. Sclerotium bataticola (= Rhizoctonia bataticola; see also bean, Macrophoma phaseoli) was reported from Maryland, North Carolina, South Carolina, Georgia, Florida, Mississippi, and Louisiana. North Carolina reported a loss of 1 per cent from this disease, the other states only a trace. Dry rot (Diaporthe batatatis) was reported from North Carolina.

OTHER DISEASES

Albugo ipomoeae-panduranae (Schw.) Sw., white rust. North Carolina: The heavy defoliation of Nancy Hall and Yellow Jersey varieties and low yields that are produced indicate that the disease is causing a reduction in yield in some areas. (Poole) Also reported from New Jersey.

Bacillus carotovorus Jones, bacterial soft rot, Connecticut.

Cold injury. North Carolina: In many sections of the state the crop is not harvested until frost has killed the vines. Frequently the delay in harvest is 7 to 10 days after frost. When rain and cold weather follow the loss from this trouble is very great (Poole).

Diaporthe batatatis (Ell & Hals.) Harter & field, dry rot. North Carolina, in a large number of storage houses causing very slight loss. (Poole)

Diplodia tubericola (Ell. and Ev.) Taub., Java black rot. Texas.

Internal breakdown. Arkansas.

Phyllosticta bataticola Ell. & Mart (=P. batatas (Thuem.) Cke.), leaf spot. North Carolina.

Phymatotrichum omnivorum (Shear) Dug., root rot. Prevalent in black lands of Texas. Estimated loss 10 per cent.

Rhizoctonia sp. was reported from Texas. O. H. Elmer of Kansas reported a disease affecting the stems of slips in the seed bed and occasionally found in the field which is suspected of being caused by Rhizoctonia. Symptoms consist of slightly elongated brown necrotic cankers that resemble Rhizoctonia cankers on Solanum tuberosum. Rotting off of the stem is frequently caused although this may be through effect of secondary invaders. A large percentage of infections are outgrown by the plant. Considerable damage was done due to the rotting off of sprouts whereupon numerous weak lateral shoots were produced.

Sclerotium rolfsii Sacc., southern blight. Georgia, Arkansas and Mississippi.

Arkansas: An unusual type of rolling in beds and blighting of slips noted commonly near Texarkana. Material all yields Sclerotium rolfsii which appears to be the sole cause of the trouble. (V. H. Young)

Georgia: According to Higgins (3) it causes serious losses throughout upper Coastal Plains section, especially bad during seasons of high temperatures in April and May. Does not spread in field but losses heavy in beds. Application of builders' hydrated lime 6 to 8 tons per acre thoroughly mixed with upper 6 inches of soil recommended as a control measure. Organic fertilizers should not be used where the disease is present.

Septoria bataticola Taub., leaf spot. Iowa, damage very slight but prevalent.

Recent literature:

1. Gray, Dan T. Plant Pathology. Ann. Rept. Arkansas Agr. Exp. Sta. (Bul. 221).39: 25-29. 1927.

2. Harter, L. L. & Whitney, W. A. Mottle Necrosis of sweet potatoes. Jour. Agr. Res. 34: 893-914. 1927.

3. Higgins, B. B. Bed rot of sweet potatoes. Ga. Agr. Exp. Sta. Circ. 80: 219-221. 1927.

4. Trottor, A. Sulla prosonza dolla 'Lasiodiplodia tubericola' Ell. ot Evr. in Egitto ('Java black-rot') o sul pericolo della sua introduzione in Italia. (On the presence of Lasiodiplodia tubericola Ell. and Ever. in Egypt ('Java black-rot') and the danger of its introduction into Italy.) Boll. R. Staz. Pat. Veg. 7: 93-98. 1927.

DISEASES OF BEAN

ANTHRACNOSE CAUSED BY COLLETOTRICHUM LINDEMUTHIANUM (SACC. & MAGN.) BRIOSI & CAV.

The severity of anthracnose was generally less in the eastern States where it usually causes decided losses. The weather was the principal factor in this but the use of disease-free seed, grown where the disease does not prevail, appears to be of benefit. In the East the disease was general. In the Middle West it was local or scattered, and not severe. In the West it was not reported, except a trace from Montana.

Table 66. Percentage losses from anthracnose of bean as estimated by collaborators, 1927.

Percentage loss	States reporting	Percentage loss	States reporting
10	Massachusetts	1	West Virginia
	Tennessee	0.5	Georgia, Michigan
2	Mississippi	0.01	Ohio
1.5- 0.5	New York	Trace	Delaware, Kentucky,
1.5	Maryland		Wisconsin, Minnesota, Missouri,
			Montana

Reports received from collaborators follow:

New York: (Nassau County) - In one planting 20 per cent of the seedlings were affected. (Hambleton)

(Erie County) - Several cases in Marilla section. (Taylor)

(Genova) - Some fields of yellow snap beans were almost a total loss. (L. K. Jones)

(Nassau County) - Losses ran high due to prolonged wet spell. (Hambleton)

Delaware: Canning crop very free this season. (Adams)

Maryland: Surveys showed less infection in fields grown from seed from Idaho, Colorado, and California than in fields grown from Michigan and New York seed. (Jehle)

Virginia: Abundant in the Tidewater region where it does little or no damage ordinarily (McWhorter).

West Virginia: Early crop suffered severely, but late beans were much less diseased. (Sherwood)

Tennessee: Very common in eastern Tennessee. Associated with strains of Giant Stringless Greenpod from certain States. (McClintock)

Missouri: Very few beans grown commercially. Anthracnose more injurious than usual in many gardens. (Scott)

Recent literature:

1. Bredemann, G. and H. ten. Doornkaat-Koolman. Zur Immunitätszüchtung bei Phaseolus vulgaris gegenüber Collototrichum lindemuthianum und seinen Biotypen. Zeitschr. Pflanzenzucht. 12: 209-217. Feb. 1927.

2. Doornkaat Koolman, H. ten. Die Brennfleckenkrankheit der Gartenbohne in Lichte der Vererbung. Versuche zur Immunitätszüchtung bei Phaseolus vulgaris gegenüber Colletotrichum lindemuthianum (Sacc. & Magn.) und seinen Biotypen. Forsch. Gebiet Pflanzenkr. & Immunität Pflanzenr. 4: 112-225. 7 pl. 1927.

3. Müller, H. R. A. Onderzoekingen over Colletotrichum lindemuthianum (Sacc. et Magn.) Bri. et Cav. en Gloeosporium fructigenum Berk. forma hollandica nova forma. Wageningen. 1927. Proefschr. Landbouwhoogeschool Wageningen.
English summary.

BACTERIAL BLIGHTS CAUSED BY BACTERIUM PHASEOLI EFS., PHYTOMONAS MEDICAGINIS PHASEOLICOLA BURK., AND B. SOLANACEARUM EFS.

B. phaseoli appears to be the commonly observed bean blight, causing rather extended losses. In no State did the amount noted increase appreciably over past years, and in most States it fell. It may be that more extended acquaintance with the Phytomonas, and B. solanacearum, as well as B. flaccumfaciens Hedges, which is not reported this year, may cause further fall in the amount of B. phaseoli reported, and more weight given the other organisms.

Reports from collaborators concerning B. phaseoli are as follows:

New York: (Nassau County) - some dusting with sulfur-lime has been done with fair results. (Hambleton)
(Ontario County) - blight is doing much damage. (Bullock)

New Jersey: Probably present in all parts of South Jersey. (Martin)

Maryland: Somewhat more prevalent than last year. (Jehle)

Kentucky: Generally present in bean plantings. (Gardner)

North Carolina: Both lima and wax beans are attacked. (Poole)

Texas: Epidemic in lower Rio Grande Valley. (Tauhenhaus)

Wyoming: Five per cent infection in the vicinity of Powell. (L. L. Harter)

Colorado: Common in Greeley section. (MacMillan)

Table 67. Percentage losses from B. phaseoli blight of bean as estimated by collaborators, 1927.

Percentage loss	States reporting	Percentage loss	States reporting
10	Oklahoma, Wisconsin	1 to 3	New York
5	Texas, Montana	1	Virginia, Indiana
2	Mississippi		Minnesota, Utah
1.5	Maryland	0.1	Tennessee
		Trace	Delaware, West Virginia, Kentucky, Georgia, Iowa, Oregon

Phytomonas medicaginis.phaseolicola.

New York: One per cent total loss for the State. Generally distributed. (L. K. Jones)

Bacterium solanacearum.

Georgia: First occurrence noted in the State. Diagnosis confirmed by Mary K. Bryan. The disease was local, in one field, and amounted to 2 per cent loss. (Boyd)

Recent literature:

1. Stapp, C. Die bakterielle Welkekrankheit der Bohnen. Nachrichtenbl. Dout. Pflanzenschutzd. 7: 88-90. Sept. 1927.
Although Bacterium flaccumfaciens has been isolated from German seed, it has not been reported from Germany itself.

RUST CAUSED BY UROMYCES APPENDICULATUS (PERS.) LINK.

Rust was generally more severe in the States reporting than is usually the case. Five States reported the Kentucky Wonder as being very susceptible, and mentioned no other variety. In Colorado the pinto bean was generally a total loss where grown under irrigation, as was Longfellow in the Greeley area. Other varieties showed varying resistance, but nearly all were injured to some extent. The rust was noted at Grand Junction on the western slope, possibly the first time it has been reported in the Great Basin.

Table 68. Percentage losses from rust of bean, as estimated by collaborators, 1927.

Percentage loss	States reporting	Percentage loss	States reporting
25	Colorado	0.1	Ohio
5	Missouri	Trace	Massachusetts, New Jersey, Maryland, West Virginia, Georgia, South Dakota
3	California		
1	Texas		
0.5	Mississippi, Virginia		

MOSAIC (VIRUS)

Mosaic was reported as occurring widely in the crop, the distribution usually being general. The eastern States reported, as a rule, only losses amounting to a trace, the Mississippi Valley and the Northwest being more severely affected. Susceptible varieties reported were Wax Yellow and Bountiful in New Jersey and Red Valentine and Burpee's Stringless in Georgia. Taubenhaus, in Texas, found the disease more prevalent following leaf-hopper injury.

As some of the losses reported appear to be high for this disease, the question must be asked if the reported losses in yield were not lower, and if the figures given do not more truthfully represent percentage of infection.

Table 69. Percentage losses from mosaic of bean, as estimated by collaborators, 1927.

Percentage	States reporting	Percentage loss	States reporting
10	Oregon, Texas, Oklahoma	1 - trace	New York
8	Utah	0.1	Tennessee
7	Montana	Trace	Massachusetts, New Jersey, Maryland, West Virginia, Kentucky, Ohio, Colorado, California
5	Wisconsin, Idaho		
4	Mississippi		
2	Indiana		
1	Georgia		

Bean - Mosaic

Recent literature:

1. Fajardo, T. G. Progress on experimental work with the transmission of bean mosaic. (Abstract) Phytopath. 18: 155, Jan. 1928.

ASHY STEM BLIGHT CAUSED BY MACROPHOMA PHASEOLI MAUBL.

Ashy stem blight was reported from Georgia and Mississippi, as follows:

Georgia: Unusually prevalent as compared with former years. At least two fields lost 50 per cent of the plants due to this. Plentiful in every bean section of the Coastal Plain area surveyed. Total loss 2 per cent. (Boyd)

Mississippi: Less than last year. Loss a trace. Observed on both spring and fall plantings; greatest injury in seedling stage of fall planting. (Wodgworth)

This fungus has been placed by Ashby (1) in the genus Macrophomina, Genetic connection of the sterile form Rhizoctonia bataticola (Taub.) Butler (Sclerotium bataticola Taub.), the organism causing the charcoal rot of sweet potatoes, with the Macrophomina pycnidial stage has been proved. The fungus is widely distributed. According to Small (4), the two stages cause distinct diseases on bean, the Macrophoma attacking the stem while the Rhizoctonia affects the roots.

Recent literature:

1. Ashby, S. F. Macrophomina phaseoli (Maubl.) comb. nov. the pycnidial stage of Rhizoctonia bataticola (Taub.) Butl. Trans. Brit. Mycol. Soc. 12: 141-147. 1927.

2. Barre, H. W. Plant disease investigations. In Ann. Rept. South Carolina Agr. Exp. Sta. 40: 45-48. 1927.

3. Briton-Jones, H. R. Macrophomina phaseoli (Maubl.) Ashby. Trop. Agr. West Indies 4: 194-195. Oct. 1927.

4. Small, W. Further notes on Rhizoctonia bataticola (Taub.) Butler. Trop. Agr. Ceylon 69: 9-12. July 1927.

STEM ROT CAUSED BY CORTICIUM VAGUM BERK. & CURT.

This disease caused 2 per cent loss in Mississippi and California, being generally distributed in both States. Losses amounting to a trace occurred in New York and Texas. In Florida it was generally distributed, and was regarded as more severe than usual, but the losses were not stated. In Virginia it caused some "wire-stem" injury. It was also reported from Utah.

ROOT ROTS DUE TO VARIOUS ORGANISMS

Fusarium martii phaseoli Burk., dry root rot, caused losses reported as 5 per cent in New York, and a trace in Massachusetts, Georgia, and Michigan. It was also reported from Florida, Oregon, and California.

Fusarium spp. causing root rot were reported as follows: Noted at Norfolk, Virginia, June 6. (Harter) An unusual amount in West Virginia (Giddings) Occurs widely in Utah (Linford). Two per cent loss from dry root rot in Idaho. (Hungerford) Loss 2 per cent in California. (Milbrath)

Phymatotrichum omnivorum (Shear) Dug., Texas root rot. Two per cent loss in Texas.

Undetermined and general. Root rots on snap beans have been common in New York. (Buckman) Severe throughout the Coastal region of South Carolina. (Moore). Unidentified root rot occurred in California, Colorado, and Wyoming. (Harter)

OTHER DISEASES

Blossom drop. Prevalent in Texas, causing 1 per cent loss.

Caconema radicicola (Greef) Cobb, root knot. Georgia. 5 per cent loss generally distributed. Texas, prevalent in light sandy loams. California, 2 per cent loss in San Joaquin Valley.

Cercospora cruenta Sacc., leaf-blotch. Georgia, prevalent on pole beans, causing slight losses. Texas, prevalent in restricted localities, causing 1 per cent loss.

Chlorosis, caused by too much lime. Slight losses in Texas.

Curly top (virus), Idaho, present in slight amount. Oregon, destructive case of mountains, causing 2 per cent loss.

Damping-off, caused by several fungi, reported from Florida.

Erysiphe polygoni DC., powdery mildew. South Carolina, single outbreak late in season. Florida, general over the State. Texas, prevalent. Iowa, damage negligible. Utah, some damage in Davis County. California, localized losses amounting to 1 per cent.

Isariopsis griseola Sacc., angular leaf spot. New York, causing slight losses in Suffolk County. Florida, local losses, slight in amount. Indiana, late season appearance on Burpee's Stringless Greenpod.

Sclerotinia sclerotiorum (Lib.) Massee, rot. Florida, generally distributed but less prevalent than usual.

Recent literature:

1. Severin, Henry H. P. Crops naturally infected with sugar beet curly top. Science n. s. 66: 137-138. Aug. 5, 1927.

DISEASES OF LIMA BEANS

Bacterium phaseoli EFS., bacterial blight. New York, Suffolk County, leaf spot is serious in some fields (Linden). Utah, a bacterial spotting has been detected, due to an organism closely resembling, but possibly distinct from the common bean blight. (Linford)

Bacterium viridifaciens, T. & W. bacterial leaf spot. New Jersey, probably present wherever the crop is grown. (Martin) Nebraska, reported for the first time; on plantings at Lincoln. (Goss)

Corticium vagum Berk. & Curt., stem rot. California, southern half of State suffered a loss of 10 per cent in yield. The disease was very severe in the upper Delta region. The loss largely due to poor stand caused by death of plants in seedling stage. (Kendrick)

Diaporthe phaseolorum (Cke. & Ell.) Sacc. pod blight. New York, local in Suffolk County, loss slight (Sindon). New Jersey, present in southern part of State (Martin). South Carolina, severe injury in very restricted localities. (Ludwig) Mississippi, present in slight amount. (Wedgworth)

Nematospora phaseoli Wingard, yeast spot. Maryland, doing severe damage in local areas. (Johlo) Virginia, present in several counties. (Fromme) Mississippi, found locally in Pontotoc County. (Wedgworth)

Phytophthora phaseoli Thax., downy mildew. Collaborators' reports are as follows:

Connecticut: Found in slight amount. (Stoddard)

New York: Observed only on Long Island, where it was favored by excessive rains, and caused 25 per cent loss of crop. (Hambleton, Sindon)

New Jersey: Very severe in all parts of the State, in some cases making it useless to harvest the crop. Losses amounted to 35 per cent of the crop. (Dept. Pl. Path.)

Pennsylvania: A few specimens were received from Berks County. (Thurston)

Delaware: General throughout the state. (Adams)

DISEASES OF ONION

SMUT CAUSED BY UROCYSTIS CEPULAE FROST

The amount of onion smut over the country appears to be declining. In Massachusetts it was less than in the average year. In New York the disease is spreading. In Wayne County there was an average of 5 per cent loss, with 12 per cent loss in untreated fields. In Genesee and Orleans Counties the smut area is gradually spreading over the muck soils. In the southern part of Orange County, considerable is present in untreated beds on old land. Pennsylvania reports that commercial onion production is declining, but that the disease occurs as formerly. A slight loss occurred in Maryland. In Ohio there was a total loss of 1 per cent with a maximum infection of 10 per cent. Dust disinfectants are being studied there. The disease was recorded in the commercial crop for the first time in Indiana, but its importance is slight. In Wisconsin the spring rains washed the formaldehyde from the soil allowing the fungus to reach the seedlings in a susceptible stage. The losses, which were local, reduced the yield 2 per cent. Minnesota, Iowa, Colorado, and Oregon report slight losses.

Recent literature:

1. Walker, J. C. An onion disease under successful control. Wisconsin Hort. 17: 155-156. June 1927.

DOWNY MILDEW CAUSED BY PERONOSPORA SCHLEIDENI UNG.

Of the nine states which reported downy mildew New York suffered the greatest loss. In Orleans and Genesee Counties it was abundant and many stands were badly injured, and it appeared in Wayne and Oswego Counties also, in all causing 2 to 3 per cent loss. California reported a 3 per cent loss, localized, the seed crop being affected. Scattered losses in Massachusetts amounted to 0.1 per cent. In Maryland and Colorado the losses were slight. In Colorado Bordeaux mixture to which a suitable sticker was added gave good results in control. Pennsylvania, Arkansas, Washington, and Oregon reported the disease present.

NECK ROTS CAUSED BY BOTRYTIS SPP.

Neck rots occurred in storage in the Twin Falls, Idaho, section, causing losses of 20 per cent. This condition existed locally, and was not reported elsewhere in the state. Indiana reported a 2 per cent loss which was very prevalent in white onions. It was not eliminated in grading. Red and yellow varieties were immune. In the Orleans-Genesee section of New York, in Louisiana, and Wisconsin, slight losses were reported. A report from Virginia states that the onion sets received were of variable quality, some car lots averaging close to 50 per cent unsalable because of Botrytis and Fusarium rots. The Yellow Danvers and Japanese varieties are mentioned, but the origin of the shipments is not.

PINK ROOT

Pink root has been attributed to Fusarium malli Taub, and other Fusaria, but Hansen (1) reports that in his studies in California an undetermined species of Phoma was found to be the initial cause and the Fusaria were secondary invaders.

Losses reported in 1927 were: 2 per cent in Texas, 0.5 per cent in California, 0.2 per cent in Ohio, and slight losses in New York and Maryland. The disease was reported from Louisiana, Michigan, and Minnesota, and for the first time from Mississippi and Utah.

Recent literature:

1. Hansen, H. N. "Pink root" of onions caused by Phoma sp. Science n. s. 64: 525. Nov. 26, 1926.

ONION SMUDGE CAUSED BY COLLETOTRICHUM CIRCINANS (BERK.) VOGL.

Smudge caused a 5 per cent total loss in Indiana, where it was universally present on white onions. The yellow and red varieties which constitute the bulk of the crop were not affected. In Missouri the disease was observed for the first time, on a single planting in Franklin County where it appeared on sets received from Illinois. The disease was noted as present in Connecticut.

OTHER DISEASES

Aspergillus niger Tiegh., black mold. One per cent loss in Texas, 2 per cent in California.

Bacillus carotovorus Jones., soft rot. Serious loss in one storage house in New Jersey.

Bastard seed head (Cause unknown). Reported from New Haven County, Connecticut.

Caconema radicicola (Greef) Cobb, root knot. Traces in Texas.

Damping-off. More than usual in the Elba district, New York. Due to wet weather.

Macrosporium porri Ell., mold. Utah, reported but not seen by collaborator in Salt Lake County.

Macrosporium sarcinula parasiticum Thuem., leafspot. Louisiana. Local occurrence at Baton Rouge.

Penicillium spp., silver spot. Indiana, General. Circular silvery patches along veins of outer scales on red and yellow varieties, detracts from the bright clear skin desired. (Gardner)

Sunscald (non-par.). Indiana. Hot weather in September and October caused 1 per cent loss. The most serious cause of loss in red and yellow varieties, which compose majority of crop. Early digging and too long exposure during heat of September promoted the scald. (Gardner)

Recent literature:

1. Nolla, J. A. B. A new Alternaria disease of onions (Allium cepa L.). Phytopath. 17: 115-132. 1927.
Alternaria allii n. sp. Porto Rico.

2. ---------- Onion-leaf anthracnose. Jour. Dept. Agr. Porto Rico 10: 245-256. July/Oct. 1926 (Sept. 1927).
Colletotrichum chardoniamum n. sp. Porto Rico.

DISEASES OF CRUCIFERS

CABBAGE

YELLOWS CAUSED BY FUSARIUM CONGLUTINANS WOLL.

Yellows was serious in Iowa where there was a total loss of 30 per cent of the crop mostly in Muscatine County, the principal cabbage-growing district of the State. The varieties Copenhagen Market and Golden Acre were severely attacked. Iacope and Marion Market were very resistant, some strains of Iacopo being particularly so. Maryland suffered an 8 per cent loss, North Carolina 1.5 per cent loss, and Louisiana, New York, New Jersey, West Virginia, Mississippi, Ohio, and Wisconsin reported slight losses. The disease was reported from Tennessee, Arkansas, Indiana, Michigan, Minnesota, Missouri, Kansas, and Kentucky, where it was severe in some home gardens.

Recent literature:

1. Mellus, I. E., and D. R. Porter. The use of selection and selfing in improving Iacope cabbage. (Abstract) Phytopath. 18: 142. Jan. 1928.

2. Walker, J. C., J. Monteith, and F. L. Wellman. Development of three midseason varieties of cabbage resistant to yellows (Fusarium conglutinans Woll.) Jour. Agr. Res. 35: 785-809. Nov. 1, 1927.

3. ----------. and F. L. Wellman. A Fusarium-resistant cabbage of Jersey Wakefield type.(Abstract) Phytopath. 18: 142. Jan. 1928.

BLACK ROT CAUSED BY BACTERIUM CAMPESTRE (PAM.) EFS.

Black rot was generally noted throughout the Mississippi Valley, and in some eastern States. No western State reported the disease. Kentucky suffered a possible loss of 10 per cent in commercial plantings, the disease being more severe on plants shipped into the state. In Texas black rot was severe in the lower Rio Grande Valley, causing 5 per cent loss. The other principal losses were, Mississippi 3 per cent, North Carolina 2 per cent, and New York 1 per cent to a trace. In some cases the percentage loss was high locally. Twelve other States reported losses amounting to a trace, and four others that it was present. Practically no comments were received from collaborators about this disease.

BLACKLEG CAUSED BY PHOMA LINGAM (TODE) DESM.

North Carolina reported 2 per cent, and Maryland and Mississippi each 1.5 per cent loss. In New York where the loss amounted to less than 1 per cent the disease was said to be decreasing due to seed treatment. Slight losses were noted in West Virginia (principally on young plants), Georgia, Ohio, and Wisconsin. Black leg was reported as present in Massachusetts, New Jersey, Delaware, Kentucky, Florida, Louisiana, Arkansas, and Minnesota.

CLUBROOT CAUSED BY PLASMODIOPHORA BRASSICAE WOR.

Only a few States report this disease any more. Wisconsin suffered the greatest loss of any, with 2 per cent reduction in yield. It was prevalent in northern Ohio, causing a loss of 1 per cent. In New York, while not regarded as serious, it caused a loss estimated between 1 and 2 per cent of the total yield. Massachusetts, Connecticut, New Jersey, Maryland, and West Virginia all reported slight losses, and Minnesota reported it as present.

Recent literature:

Wellman, F. L. The reaction and treatment of soils infested with Plasmodiophora brassicae Wor. (Abstract) Phytopath. 18: 141-142. Jan. 1928.

OTHER DISEASES

Alternaria brassicae (Berk.) Sacc., black leafspot. New York, statewide, of no economic importance. Georgia, abundant in seedlings raised for shipment. New Jersey, Mississippi, Louisiana, Indiana.

Cabbage - Other Diseases

Bacillus carotovorus Jones, bacterial soft rot. New York, trace, not as serious as usual. Minnesota.

Bacterium maculicolum McCul., peppery leaf spot. California, local, 0.5 per cent loss. New York, Washington.

Black spot (non-par). Washington, usual amount.

Botrytis sp., gray mold. California, general, causing 2 per cent loss.

Caconema radicicola (Greef) Cobb, root knot. Texas, prevalent in light sandy loams, causing 0.5 per cent loss.

Intumescences (non-par.) Washington, single report.

Mosaic (undet.) New York, rarely observed in Suffolk County.

Mycosphaerella brassicicola (Duby) Lindau, ringspot. California, worse than usual, 6 per cent loss.

Oedema (non-par.) New Jersey, single report.

Peronospora parasitica (Pers.) D By., downy mildew. New York, very common but not destructive, loss slight. New Jersey, general. Georgia, abundant on seedlings. Florida, general. Texas, 2 per cent loss on early cabbage. California, general, loss 1 per cent. Mississippi and Louisiana, reported as present, no loss.

Tipburn (non-par.) New York, loss 1 to 2 per cent. Many fields were badly damaged, so that from a distance they looked almost black. In addition to moisture, fertilizers seem to have important relationship. (Chupp)

Corticium vagum Berk. & Curt, wire stem. New York, common throughout the state. Very well controlled by frequent applications of mercuric chloride 1-2000 to the seed bed while plants are growing. Loss 1 to 3 per cent. South Carolina one local outbreak noted. North Dakota, observed for the first time.

Sclerotium rolfsii Sacc., southern blight. Texas.

Sclerotinia sclerotiorum (Lib.) Mass. Florida.

Recent literature:

1. Walker, J. C. Diseases of cabbage and related plants. U. S. Dept. Agric. Farmers' Bull. 1439. 30 pp. 1927.

CHINESE CABBAGE

Alternaria herculea (Ell. & Mart.)Elliott, leafspot. Indiana, of slight importance.

Chinese Cabbage

Plasmodiophora brassicae Wor., clubroot. Ohio, serious in some fields. Apparently worse than in cabbage.

Recent literature:

1. Davis, W. H. Notes on the Cercosporella leafspot of Chinese cabbage in Massachusetts. Phytopath. 17: 669-670. Sept. 1927.

C A U L I F L O W E R

Alternaria brassicae (Berk.) Sacc., black leafspot. New Jersey, only one report, but probably general. California, 0.5 per cent loss.

Bacterium campestre (Pam.) EFS., black rot. New York, 1 to 2 per cent loss. Very little in State since seed treatment has become general.

Bacterium maculicolum McCul., peppery leafspot. New York, loss up to 0.5 per cent, general. California, 0.5 per cent loss. Connecticut, Washington.

Corticium vagum Berk. & Curt., wire stem. New York, 1 to 2 per cent loss. Minnesota, Kentucky, Washington.

Mycosphaerella brassicicola (Duby) Lindau, ring spot. California, 8 per cent loss.

Peronospora parasitica (Pers.) D By., downy mildew. New Jersey, general. Virginia, severe where late infection occurred.

Phoma lingam (Tode) Desm., blackleg. New York, 1 to 2 per cent loss. Virginia, severe on cold-frame plantings of Snow Queen variety. Pennsylvania.

Plasmodiophora brassicae Wor., club root. New York, Connecticut.

Whiptail (non-par.) New York, general, 2 to 3 per cent loss.

Recent literature:

Weber, G. F. Disinfect your seed before planting. Treatment controls seed-borne diseases. Florida Grow. 35 (10): 47. March, 1927.

B R O C C O L I

Plasmodiophora brassicae Wor., club root. New York, slight loss. Reported only from Nassau County.

BRUSSELS SPROUTS

Alternaria brassicae nigrescens Rogl., leaf spot. Indiana, local infections.

HORSERADISH

Albugo candida (Pers.) Kuntz., white rust. Connecticut, Ohio, Iowa.

Alternaria brassicae (Berk.) Sacc., leaf spot. Reported for first time from Iowa, and Utah.

Alternaria herculea (Ell. & Mart.) Elliott, leafspot. New York, very common in Nassau County.

Cercospora armoraciae Sacc., leafspot. Reported from Indiana and Utah, and from Iowa for the first time.

Curly top (virus). Oregon: Total loss 20 per cent, including 10 per cent reduction in yield, and 10 per cent other loss. Up to 30 per cent disease noted in plants, all of which came from vegetative propagations from diseased plants of year before. No current season spread because leaf hoppers were absent from horseradish locality this year. Abundant moisture inimical to leafhoppers. (McKay)

Ramularia armoraciae Fckl., leafspot. Utah.

KALE

Bacterium campestre (Pam.) EFS., black rot. Virginia, severe.

Fusarium conglutinans Woll., yellows. California, 20 to 30 per cent loss in the Petaluma section, where it is grown for greens for poultry.

MUSTARD

Albugo candida (Pers.) Kuntze, white rust. Mississippi.

RADISH

Albugo candida (Pers.) Kuntze, white rust. Ohio, isolated cases. Michigan, 15 per cent loss. Iowa, very general.

Aphanomyces raphani Kendrick, black root. Indiana, Iowa.

Radish

Recent literature:

Kendrick, J. B. The black-root disease of radish. Indiana Agr. Exp. Sta. Bul. 311. 32 pp. June, 1927.

RAPE

Plasmodiophora brassicae Wor., club root. New Jersey, 4 acre field at College farm destroyed. (Martin)

RUTABAGA

Bacterium campestre (Pam.) EFS., black rot. Mississippi.

TURNIP

Albugo candida (Pers.) Kuntze, white rust. Florida, Texas.

Alternaria sp., leaf spot. Utah.

Alternaria herculea (Ell. & Mart.) Elliott, leaf spot. Indiana.

Bacillus carotovorus Jones, soft rot. Kansas.

Bacterium campestre (Pam.) EFS., black rot. Massachusetts.

Colletotrichum higginsianum Sacc., anthracnose. Mississippi.

Erysiphe polygoni DC., powdery mildew. Indiana, Iowa, Utah.

Mosaic (Virus). Kansas, Indiana, Mississippi.

Recent literature:

1. Cunningham, G. H. Dry-rot of swedes and turnips: its cause and control. Bul. New Zealand Dept. Agr. 133. 51 p. July, 1927.
Phoma lingam (P. napo-brassicae)

2. Murphy, Paul A. Some fungus diseases of root crops. Jour. Dept. Lands & Agr. Ireland 27: 12-23. 1927.

3. Wormald, H., and R. V. Harris. Bacterial rot of turnips. Ann. Rept. East Malling Res. Sta. 13 (II Suppl.): 89-91. 1927.
Bacillus carotovorus.

DISEASES OF CUCURBITS

CUCUMBER

BACTERIAL WILT CAUSED BY BACILLUS TRACHEIPHILUS EFS.

The reports from collaborators generally did not contain extended comment on the disease. A few are of interest.

Connecticut: More of this trouble than in the average season. (Clinton)

Delaware: Very common and spread may be associated with heavy prevalence of beetle. (Adams)

Wisconsin: Not seen in field. Few reports from Milwaukee greenhouses. (Vaughan).

The disease was reported from Connecticut, New Jersey, Virginia, Florida, Indiana, Wisconsin, and Minnesota.

Table 70. Percentage losses from bacterial wilt of cucumber, as estimated by collaborators, 1927.

Percentage loss	States reporting	Percentage loss	States reporting
10	Iowa, West Virginia	Trace	North Carolina, Georgia, Missouri, Kansas, Colorado
7.5	New York		
2	Ohio		
1	Texas		

Recent literature

1. Clayton, E. E. Effect of early spray and dust applications on later incidence of cucumber wilt and mosaic diseases. Phytopath. 17: 473-481. July, 1927.

2. Isely, D. The striped cucumber beetle. Arkansas Agr. Exp. Sta. Bul. 216. 36 pp. 1927.

3. Jewett, H. H. The striped cucumber beetle. Kentucky Agr. Exp. Sta. Circ. 37: 19-34. 1927.

ANGULAR LEAFSPOT CAUSED BY BACTERIUM LACHRYMANS ERS. & BRYAN

The disease was prevalent in the western half of New York, and caused a total loss estimated at 1 to 3 per cent. Ohio, Illinois, and Wisconsin reported slight losses. Georgia, Minnesota, Iowa, and Utah reported the disease, but not as causing appreciable losses. In Indiana it was found in greenhouses.

Cucumber - Angular Leafspot

Recent literature

Weber, George F. Cucumber fruit-rot and angular leafspot.(Abstract) Phytopath. 18: 133. Jan. 1928.

ANTHRACNOSE CAUSED BY COLLETOTRICHUM LAGENARIUM (PASS.) ELL. & HALST.

Anthracnose was of increased severity in West Virginia, causing a 5 per cent estimated loss. Slight losses were reported in New York, Delaware, Georgia, and Ohio, where it also appeared in greenhouses. It was reported from Delaware, Florida, Wisconsin, and Minnesota, and from Massachusetts in greenhouses.

MOSAIC (VIRUS)

The mosaic disease appears to be increasing in importance in some producing sections. Other diseases and accidents have reduced the apparent severity of the disease in some quarters. In New York it is gradually getting worse up state, and has been severe on Long Island for a long time. No resistant varieties were observed. The losses ranged from 30 to 50 per cent. (Chupp) In Massachusetts, where the crop is of much less importance, the loss was 10 per cent. In California it was general, with a loss of 5 per cent. Maryland lost 3.5 per cent of the crop, and Texas 1 per cent. Slight losses were reported from Ohio, Missouri, Iowa, North Dakota, and Colorado, and eleven other states reported mosaic as present, including North Carolina and Indiana, where it appeared in greenhouses.

Recent literature

1. Doolittle, S. P., and M. N. Walker. Aphis transmission of cucumber mosaic. (Abstract) Phytopath. 18: 143. Jan. 1928.

2. Gilbert, W. W. Cucurbit mosaic control a demonstrated fact. U. S. Dept. Agr. Ext. Path. 6: 4. Jan. 1928.

3. Porter, R. H. Further evidence of resistance to cucumber mosaic in the Chinese cucumber. (Abstract) Phytopath. 18: 143. Jan. 1928.

DOWNY MILDEW CAUSED BY PSEUDOPERONOSPORA CUBENSIS (BERK. & CURT.)ROSTEW.

Except for a severe epidemic in Florida causing an estimated loss of 25 per cent and 10 per cent loss in Texas, little damage was reported from downy mildew. Maryland reported 0.5 per cent loss, New York, West Virginia, Georgia, and Missouri slight losses, and Massachusetts, Delaware, and Virginia the occurrence of the disease.

OTHER DISEASES

Caconeme radicicola (Greef) Cobb, root knot. Georgia, general, total loss 15 per cent. (Boyd) Texas, 1 per cent loss. Mississippi, found in greenhouses. Oregon, slight losses. California, 2 per cent loss, localized.

Cladosporium cucumerinum Ell. & Arth., scab. This disease seems to be spreading in New York, although it has not become serious except in a few fields and greenhouses. Those who followed recommendations for control had very good success. Losses reported trace to 0.5 per cent. (Chupp) Reported present in Maine, Connecticut, and Wisconsin.

Curly-top (virus) Oregon, important east of mountains.

Erysiphe cichoracearum DC., powdery mildew. Texas, 5 per cent loss. California, 3 per cent loss. Present in Massachusetts, New York, and Indiana.

Macrosporium cucumerinum Ell. & Ev., leafblight. New York, general all over the State, causing loss of 2 to 3 per cent. Maryland, 2 per cent loss. Present in New Jersey, Florida, and Utah.

Mycosphaerella citrullina C. O. Smith, gummy stem-blight. New Jersey, one report.

Sclerotinia sclerotiorum (Lib.) Massee, wilt. Washington, single report.

M U S K M E L O N

LEAFBLIGHT CAUSED BY MACROSPORIUM CUCUMERINUM ELL. & ARTH

As a rule leafblight was general in those States reporting it and caused heavy losses in some cases. New York, New Jersey, and Delaware reported the disease as general but mentioned no losses. In Maryland the loss was 8 per cent but would have been much greater had not so many fields been dusted or sprayed. (Jehle) The 15 per cent loss in Georgia was in a measure due to the late development of the main crop which carried it into July. (Boyd) In Florida and Texas there were local outbreaks. In Arkansas the disease was severe. No accurate loss data is available, but in local instances as much as 70 per cent was reported. (V. H. Young) In Illinois there was a general loss amounting to 10 per cent. Here the "Hearts of Gold" variety seemed resistant. (Meckstroth and Stout). Michigan reports only 1 per cent loss, due to the widespread use of sprays for control. (Div. Bot.) It is mentioned as occurring in Colorado, Utah, and Oregon, but appears to be a negligible factor in production.

BACTERIAL WILT CAUSED BY BACILLUS TRACHEIPHILUS EFS.

This disease appears to have increased in severity slightly over the average, due in some cases to unfavorable weather conditions and in others to neglect of the approved control methods. It was reported as present in New Jersey, Virginia, Kentucky, Florida, Louisiana, Michigan, Minnesota, and Kansas. In New York and South Dakota the losses were slight. However, Iowa suffered a 5 per cent loss, Illinois 4 per cent, Ohio 3 per cent, Mississippi and West Virginia 1 per cent, and Maryland 0.5 per cent.

ANTHRACNOSE CAUSED BY COLLETOTRICHUM LAGENARIUM (PASS.) ELL. & HALS.

In West Virginia anthracnose is regarded as of considerable importance. In 1927 it was very severe, was found in practically every field, and caused a total loss of 10 per cent. This was due to the late planting and the wet cold spring followed by hot wet weather in midseason. (Sherwood) Maryland reported 0.2 per cent loss, which would have been worse had the disease not been checked by dusting with copper-lime dust. In New Jersey, Delaware, Georgia, Ohio, Michigan, and Iowa the disease was general and caused slight losses. It was reported as present without doing appreciable damage in North Carolina, Florida, Arkansas, Wisconsin, Minnesota, and Kansas.

DOWNY MILDEW CAUSED BY PSEUDOPERONOSPORA CUBENSIS (BERK. & CURT.) ROSTEW.

Downy mildew was very severe in the lower Rio Grande Valley in Texas causing a total loss estimated at 90 per cent of the crop. In Maryland there was a loss of 1 per cent but the use of control measures probably prevented a greater loss. Virginia, Georgia, Illinois, and Arkansas suffered slight losses. Delaware, Florida, and Louisiana report the disease present without appreciable loss.

MOSAIC (VIRUS)

Chupp states that in New York"Mosaic seems to be spreading rapidly in upstate sections and will finally ruin the crop if a remedy cannot be found. Destroying known weed hosts has not proved satisfactory yet." In Connecticut, according to Clinton, five reports were received, one of almost complete loss. Valleau in Kentucky reports "Only occasional plants found affected. The virus transfers to tobacco where it produced necrotic lines somewhat similar to ringspot, but it may be cucumber mosaic." Other reports of occurrence were received from Delaware, Maryland, Ohio, Michigan, Wisconsin, Iowa, Colorado, and California In no case was the loss when estimated greater than 0.1 per cent

POWDERY MILDEW CAUSED BY ERYSIPHE CICHORACEARUM DC.

In Georgia there was a total loss of 10 per cent, including reduction in yield and in quality. In the Imperial Valley, California, a loss of 5 per cent is estimated, which, although large considering the value of the crop is slight when compared to the disastrous loss of 1926. The disease was reported from New York and Texas also.

Recent literature

Sherbakoff, C. D. Powdery mildew of muskmelon. Phytopath. 17: 414-415. June 1927.

OTHER DISEASES

Caconema radicicola (Greef) Cobb, root knot. Georgia, general in southern part, increasing in amount slightly. Loss totals 10 per cent. (Boyd) Texas, prevalent on light sandy loams. California, general, causing 5 per cent loss. New Mexico, present in southern part.

Chlorosis. Too much lime, Texas, trace.

Cladosporium cucumorinum Ell. & Arth., scab. Massachusetts, Virginia.

Curly top (virus). Oregon, very destructive in local areas in eastern Oregon. Losses 20 per cent, maximum field infection 90 per cent.

Fusarium sp., fruit rot. Maryland, Texas, New Mexico, California.

Sclerotium rolfsii Sacc. Texas, prevalent.

PUMPKIN

Bacillus tracheiphilus EFS., wilt. Colorado, general where pumpkins are grown. (Le Clerg)

Erysiphe cichoracearum DC., powdery mildew. Colorado, present in western slope fields. (Le Clerg)

SQUASH

Bacillus carotovorus Jones, soft rot. Maryland.

Bacillus tracheiphilus EFS. Bacterial wilt. Connecticut, New Jersey, Iowa, and probably Utah.

Caconema radicicola (Greef) Cobb, root knot. Texas.

Curly top (virus). Utah, Oregon, California.

Fusarium sp., wilt. Texas.

Macrosporium cucumerinum Ell. & Ev., leaf blight. Utah.

Mosaic (virus). Connecticut, New Jersey, Louisiana, Texas.

Pseudoperonospora cubensis (Berk. & Curt.) Rostew., downy mildew. Delaware, Texas.

W A T E R M E L O N

ANTHRACNOSE CAUSED BY COLLETOTRICHUM LAGENARIUM (PASS.) ELL. & HALST.

The disease was of real importance in practically all of the seventeen States from which it was reported. The losses were high as a rule, and in several States it was much more prevalent than in the average year.
Some of the reports from Collaborators are instructive:

West Virginia: Crop was very late. The wet, cold spring followed by hot moist weather in midseason spread the disease to practically all patches. (Sherwood)

North Carolina: Seed transmission apparently of considerable importance as evidenced by the appearance of disease in several fields of newly cleared land. (Fant)

Georgia: Little damage to the early crop. Disease became epidemic only during the delayed July crop. (Boyd)

Table 71. Percentage losses from anthracnose of watermelon as estimated by collaborators, 1927.

Percentage loss	States reporting	Percentage loss	States reporting
25	South Carolina	1	Texas
20	West Virginia	Trace	Iowa
10	Georgia, Illinois	Present,	New Jersey, Delaware
8	Maryland, North Carolina	no loss estimate:	Kentucky, Tennessee, Florida, Louisiana, Arkansas.
5	Kansas		
2	Mississippi		

WILT CAUSED BY FUSARIUM NIVEUM EFS.

Wilt was severe in Iowa appearing in the field in the seedling stage and causing a loss estimated at 50 per cent. This is probably the controlling factor in Muscatine County, the principal growing section, as formerly about 7,000 acres were grown, but now only about 500 are planted. (Archer) In Illinois the disease was severe also, the losses amounting to 25 per cent, and being general over the State. In States where the watermelon is a major crop the losses were less, Mississippi reporting 3 per cent, Georgia 2 per cent, Texas 1 per cent. The total loss in California was 5 per cent, but losses in Stanislaus County were much heavier. North Carolina, Florida, Louisiana, Arkansas, and Utah, merely report the disease as present.

OTHER DISEASES

Bacillus trachoiphilus EFS., bacterial wilt. Maryland, slight loss. Virginia and Florida, present.

Blossom-end rot (unknown). Texas, 2 per cent. Georgia, 1.5 per cent. Iowa, 1 per cent. Present in Utah.

Oospora radicicola (Greef) Cobb, root knot. Georgia, 2 per cent loss in yield, 4 per cent in quality. California, 5 per cent general loss. Texas, prevalent.

Capnodium sp., honeydew. Texas.

Cercospora citrullina Cke., leafspot. Texas.

Erysiphe cichoracearum DC., powdery mildew. New York: eleven varieties of watermelons were grown in the University vegetable gardens. All of them had some mildew on the fruit, but none on the leaves. The Monte Cristo and White Seeded Angeline were much more severely infected than others. Burrell's Select Winter Queen was almost free from the mildew (Chupp).

Macrosporium cucumerinum Ell. & Ev., leafblight. Utah.

Pseudoperonospora cubensis (Berk. & Curt.) Rostow., downy mildew. Georgia, California, Missouri, all report slight losses. Present in Delaware and Florida. This is the first year the disease was reported from Missouri.

Rhizoctonia sp. Georgia, slight loss. Texas.

Sclerotium rolfsii Sacc., ground rot. Georgia, 2 per cent loss, scattered.

Thielavia basicola (Berk. & Br.) Zopf., black root rot. Utah.

Recent literature

1. Porter, D. R. Watermelons that won't wilt on sick ground. Rep. Iowa State Hort. Soc. 61 (1926): 213-216. (1927)

2. ---------- Studies with the watermelon wilt, caused by Fusarium niveum E.F.S. (Abstract). Phytopath. 18: 143-144. Jan. 1928.

3. ---------- Varietal resistance of watermelons to wilt (Fusarium niveum E.F.S.). (Abstract). Phytopath. 18: 144. Jan. 1928.

DISEASES OF CELERY

EARLY BLIGHT CAUSED BY CERCOSPORA APII FRESENIUS

This disease was especially severe in Massachusetts, the field losses amounting to 5 to 10 per cent of the crop. This years' attack was regarded by Davis as the worst in five years or longer. The loss in Ohio was 0.2 per cent, and slight losses were reported in New York and Colorado. The disease was present in Connecticut, New Jersey, Tennessee, North Carolina, Indiana, Minnesota, North Dakota, and Iowa. In the latter state it was reported for the first time.

LATE BLIGHT CAUSED BY SEPTORIA APII ROSTR.

Late blight was less severe than in 1926, although apparently more widespread. Twenty-four states report it to some extent. Losses reported were Ohio and Michigan each 5 per cent, Kansas and Colorado each 2 per cent, New York 1 per cent, Massachusetts, Wisconsin, and Utah slight losses. Sixteen other states report the disease. The following comments are of interest:

New York: A very serious disease where the seed bed and fields are not sprayed or dusted carefully (Chupp).

Kentucky: At Paducah all men sprayed and losses were slight. (Vallcau)

North Carolina: Severe the latter part of the season (Poole).

Wisconsin: Outer infected leaves trimmed off so losses were minor (Vaughan).

OTHER DISEASES

Bacillus carotovorus Jones, heart rot. New York.

Bacterium apii Jagger, bacterial blight. New York 0.5 per cent loss. Delaware, Ohio, Michigan, Minnesota.

Black heart (undet.). Florida, Idaho, Utah, California.

Caconema radicicola (Greef) Cobb, root knot. Florida, Ohio, California.

Fusarium sp., yellows. Slight losses in Ohio and Michigan. Present also in New York, Ohio, Minnesota.

Hollow-stem (undet.) California.

Marl disease (undet.) Michigan.

Mosaic (virus). Connecticut, Florida.

Root-rot (undet.) New York, Ohio.

Rhizoctonia sp. Damping-off. New Jersey, Virginia.

Sclerotinia sclerotiorum (Lib.) Mass. Pink rot. Florida, California.

Recent Literature

1. Leach, J. G. The relation of insects and weather to the development of heart rot of celery. Phytopath. 17: 663-667. Sept. 1927.

2. Dye, H. W. Celery blight control. Ann. Rept. Veg. Grow. Assoc. Ontario. 22: 20-24. 1927.

DISEASES OF LETTUCE

Bacillus carotovorus Jones, soft rot. California: 0.5 per cent loss in Monterey County (Milbrath). Connecticut.

Botrytis sp., gray mold rot. New York: occurred in a few cold frames in Nassau County where early lettuce was coming into head (Hambleton). California: loss 2 per cent, localized (Milbrath). Present in greenhouses in Connecticut and Indiana, and reported from New Jersey as state-wide.

Lettuce - Diseases

Bremia lactucae Regel., downy mildew. California: 10 per cent estimated loss. Heavy in the Imperial Valley (Milbrath). New York: loss slight to 0.25 per cent. Reported from Connecticut, Virginia and Indiana.

Brown blight. (undet.) California: Imperial Valley losses 4 per cent (Milbrath).

Chlorosis. (non-par.) Texas: trace.

Corticium vagum Berk. & Curt. Bottom rot noted in the Genesee-Orleans section, New York (Cook). Stem rot found in Indiana greenhouses. (Gardner). Root rot local in some Texas communities (Taubenhaus).

Macrosporium sp., leaf spot. New York: trace in Elba district.(Chupp)

Marssonina panattoniana (Berl.) Magn. Anthracnose. New York: scattered outbreaks, losses slight (Chupp).

Phymatotrichum omnivorum (Shear) Duggar, root rot. Texas: Prevalent on overgrown lettuce (Taubenhaus).

Rio Grande disease (unknown). Texas: trace in Rio Grande Valley. (Taubenhaus).

Root rot (unknown). New York: A dipterous larva inhabiting lettuce roots has done considerable damage in one locality. A root rot follows the injury--losses slight. (Hambleton).

Sclerotium sp., drop. Virginia: Causes a typical "drop." At present it does little damage. In wet years it may become serious. The organism appears to belong to the group of S. delphinii rather than S. rolfsii (McWhorter).

Sclerotinia sclerotiorum (Lib.) Massee, drop. California: 3 per cent loss, general (Milbrath). Indiana: in greenhouses when the lettuce was watered too heavily. Reported also from New Jersey, South Carolina, Florida, Washington.

Septoria lactucae Pass., leafspot. New Jersey, Virginia.

Stem girdle (unknown). New York.

Tip-burn (non-par.) New York: In the Genesee-Orleans section 25 to 35 per cent damaged. Injury appears to be much more severe in muck soils with large amounts of available potash and an excess of nitrogen (Chupp). California: general loss of 3 per cent (Milbrath). New Jersey: severe in parts of Cumberland County (Martin). Noted in Utah and Washington.

Wilt. (undet.) New York: A very common and serious disease. Losses about 0.5 per cent (Chupp).

Yellows (undet.) New York. Elba District as high as 40 per cent in some fields, common in Nassau County. Total loss estimated at 3 per cent (Chupp).

General note. New York: Although the estimates for losses of lettuce seem very high, all the field men feel that the figures are conservative. Taking the maximum of all diseases the total is 77.75 per cent loss. The field men insist that 80 or even 90 per cent would be no exaggeration. (Chupp).

DISEASES OF PEAS

ROOT ROTS AND WILTS CAUSED BY VARIOUS ORGANISMS

Aphanomyces euteiches Drechs., root rot. Losses: Maryland 8 per cent, Wisconsin 5 per cent, Utah 3 per cent, Minnesota 1 per cent, California 0.5 per cent. Slight losses in New York and Ohio. Reported also from Connecticut, New Jersey, Delaware.

Corticium vagum Berk. & Curt., root rot. Montana. Local losses as high as 90 and 100 per cent. The disease is very common but usually does little damage (P. A. Young). New York, loss 5 per cent. Present in New Jersey and Utah.

Fusarium sp., root rot. California.

Fusarium martii pisi Jones, root rot. California, general. Losses 2 per cent (Milbrath). Minnesota, losses 0.6 per cent. Infection aided by poor growing weather. (Sec. Plant Path.) Maryland, 0.5 per cent loss, general. Colorado, causing some damage (Le Clerg). Iowa, causing slight losses, scattered. (Archer) Reported also from Maine.

Undetermined. Arkansas, in home gardens. Utah, in old pea fields (New York).

Recent literature:

1. Linford, M. B. Additional hosts of Aphanomyces euteiches, the pea rootrot fungus. Phytopath. 17: 133-134. Feb. 1927.

2. Haenseler, C. M. Pea root rot studies. Ann. Rept. New Jersey Agr. Exp. Sta. 47: 334-339. 1927.

BLIGHT CAUSED BY ASCOCHYTA SPP.

The most serious loss reported was 5 per cent in restricted sections in California. New York and Maryland reported slight losses. Leafspot was reported from Delaware, leafspot and foot rot from New Jersey, and pod spot from Louisiana and Minnesota.

Pea - Blight

Two papers dealing with these organisms appeared during the year. Three species of Ascochyta are concerned - I, A. pisi Lib.; II, the pycnidial stage of Mycosphaerella pinodes (Berk. & Blox.) Stone described by Jones (1) as A. pinodes; and III, another form designated by Linford and Sprague (2) as "M pinodes micro form?" but described by Jones as A. pinodella. All three cause spotting of leaf, stem, pod and seeds. M. pinodes and A. pinodella cause a foot rot also. Apparently M. pinodes was responsible for most of the severe outbreaks of Ascochyta blight that have been reported. A. pinodella is able to live in the soil for at least two years. All three species are carried in the seed.

Recent literature:

1. Jones, L. K. Studies of the nature and control of blight, leaf and pod spot, and footrot of peas caused by species of Ascochyta. New York (Geneva) Agr. Exp. Sta. Bul. 547. 46 p. Dec. 1927.
2. Linford, M. B. and R. Sprague. Species of Ascochyta parasitic on the pea. Phytopath. 17: 381-397. 1927.

OTHER DISEASES

Bacterium pisi. (Sack.) EFS., bacterial blight. Minnesota, losses 0.5 per cent on canning peas. Slight losses in New York and Wisconsin. In the latter state the trouble is largely outgrown at the canning stage according to Vaughan. Reported from New Jersey, Florida, and Utah, and possibly occurring in South Carolina.

Caconema radicicola (Greef) Cobb, root knot. Texas, Utah.

Chlorosis (undet.) Vermont, due to root rot or malnutrition. Texas, due to excess lime.

Colletotrichum pisi Pat., anthracnose. Wisconsin, slight damage. Minnesota, first report.

Erysiphe polygoni DC., powdery mildew. One per cent loss in Minnesota and California, slight loss in Iowa. Reported from Florida, Louisiana, Texas, New Mexico, Utah.

Fusicladium pisicola Linford, black leaf. Utah.

Mosaic (virus) New Jersey, Utah.

Peronospora viciae (Berk.) D By., downy mildew. Slight losses, Minnesota, Utah, North Carolina, California.

Pythium sp., root rot. South Carolina, followed cold weather (Ludwig).

Septoria flagellifera Ell. & Ev., leaf spot. Minnesota.

Pea - Other Diseases

Septoria pisi West., leaf blotch. Minnesota 0.5 per cent loss. New York trace. Florida, Minnesota.

Thielavia basciola (Berk. & Br.) Zopf., black root rot. New York, trace.

Recent literature:

1. Crawford, R. F. Powdery mildew of peas. New Mex. Agr. Exp. Sta. Bul. 163. 13 p. June 1927.

2. Hynes, H. J. Defective germination in peas. The desirability of local seed production. Agr. Gaz. New South Wales 38: 251-254. March 1927.

3. Skoric, V. Bacterial blight of pea: overwintering, dissemination, and pathological histology. Phytopath. 17: 611-627. Sept. 1927.

DISEASES OF COTTON

WILT CAUSED BY FUSARIUM VASINFECTUM ATK.

In 1927 the damage caused by wilt was moderate, but important, considering the extent and value of the crop. In Texas the losses were 8 per cent, in Oklahoma 5 to 6 per cent. In Arkansas where the loss was 4 per cent, it is considered the most destructive plant disease in value of crop according to V. H. Young. In North Carolina 2 per cent loss was reported by Fant, who stated that the varieties "Dixie Triumph" and "Super Seven" are most extensively grown of the resistant strains. New localities in the Piedmont section were added to the known infested acreage in South Carolina where the loss was 2 per cent. One per cent loss was reported from Tennessee and Georgia, and slight losses from Virginia and Missouri.

Recent literature:

1. Fahmy, Tewfik. The Fusarium disease of cotton (wilt) and its control. Intern. Rev. Agr. 18: 601-602. June 1927. Fusarium vasinfectum aegyptiacum Fahmy.

2. Fulton, H. R. Organic fertilizers and cotton wilt control. Science n. s. 66: 193-194. Aug. 26, 1927.

3. Gray, Dan T. Plant Pathology. In Ann. Rept. Arkansas Agr. Exp. Sta. 39 (Bul. 221): 25-29. Aug. 1927.

4. Neal, D. C. Cotton wilt: a pathological and physiological investigation. Ann. Missouri Bot. Gard. 14: 359-424. Nov. 1927.

5. Woodroff, Naomi C. A disease of cotton roots produced by Fusarium moniliformo Sheld. Phytopath. 17: 227-238. 1927.

ANTHRACNOSE CAUSED BY GLOMERELLA GOSSYPII (SOUTHWORTH) EDG.

The importance of anthracnose may best be judged from comments from some of the collaborators:

South Carolina: Appeared as a seedling disease, not recorded as a boll rot. (Ludwig).

Mississippi: Frequently more serious on heavy alluvial soil where cotton growth is rank.

Louisiana: There was considerable loss due to boll rot on low alluvial lands (Brown).

Arkansas: Certain strains such as "Trice " were badly affected on the bolls. Apparently there is a great difference in strains. (Young).

Table 72. Percentage losses from anthracnose of cotton as estimated by collaborators, 1927.

Percentage loss	States reporting	Percentage loss	States reporting
10	Tennessee	1.	Missouri
3	Oklahoma	0.5	Arkansas
2-3	Mississippi	0.2	Louisiana
2	Virginia	Trace	South Carolina,
1.8	North Carolina		Georgia
		Present	Texas

ANGULAR LEAF SPOT CAUSED BY BACTERIUM MALVACEARUM EFS.

As a whole the disease appeared to be of less importance than in 1926. The greatest loss, 5 per cent, was reported from Tennessee. In North Carolina it was found in all counties where cotton is grown, chiefly causing leaf lesions. The loss was 1.5 per cent (Lehman and Fant). One per cent loss was caused in South Carolina, Oklahoma, Texas, Arkansas, and Mississippi. Slight losses occurred in Virginia and Georgia. It was present in Louisiana and New Mexico.

Recent literature:

1. Archibald, R. G. Sulfuric acid treatment of cotton seed. Soil Science 23: 1-3. 1927.

2. ---------- Black arm disease of cotton with special reference to the existence of the causal organism. B. malvacearum, within the seed. Soil Science 23: 5-9. 1927.

3. Massey, R. E. On the relation of soil temperature to angular leafspot of cotton. Ann. Bot. 41: 497-507. July 1927.

4. Sherbakoff, C. D. A modified method of delinting cotton seed with sulphuric acid. Phytopath. 17: 189-193. 1927.

ROOT KNOT CAUSED BY CAConema RADICICOLA (GREEF) COBB

While few collaborators commented on the presence of this disease, undoubtedly it occurred to some extent in each cotton producing state, especially on sandy soils. Oklahoma reported 5 per cent loss. Arkansas 2 per cent, and Missouri, Georgia, and North Carolina each 1 per cent. Slight losses occurred in Virginia, South Carolina, and Mississippi.

STEM ROT, SORESHIN, DAMPING-OFF CAUSED BY CORTICIUM VAGUM BERK. & CURT.

Stem rot caused 0.5 per cent loss in Tennessee during the early season when it was wet and cool. Stem rot and soreshin occurred in Arkansas. Soreshin caused the heaviest loss in Texas, taking 3 per cent of the stand. Damping-off caused slight losses in Mississippi and New Mexico.

Recent literature:

1. Park, M. Some investigations into conditions affecting the parasitism of Rhizoctonia solani Kühn. Ann. Rept. Bot. Gard. Peradeniya 10: 259-273. July 1927.

WILT CAUSED BY VERTICILLIUM ALBOATRUM REINKE & BERTH.

The following quotation taken from a letter of C. D. Sherbakoff is of especial interest:

"During latter part of September of 1927 Prof. S. H. Essary brought in for my examination samples of cotton wilt collected by him, in company with Mr. Newman Hancock, in various fields of Lake County, Tennessee, on September 19 and 20, 1927. Prof. Essary states that many of the wilted cotton plants still had green branches near the ground while the tops were dead with squares still clinging. According to Mr. Hancock, they examined at least a dozen typical cotton fields in Lake County and found

the wilt generally present, affecting on an average at least 10 per cent of the plants, and he states also that in the growers' opinion the wilt occurs irregularly about one in three or four years.

"My cultural examination of four of the specimens of the wilt showed for two of them a uniform presence of Verticillium albo-atrum in pure condition and for the two others a miscellaneous collection of various fungi, but none of Fusarium vasinfectum. Therefore, the writer is inclined to believe that the wilt in Lake County (West Tennessee, along the Mississippi River) is due to Verticillium albo-atrum. The cultures of Verticillium obtained from the wilted cotton samples are indistinguishable from the Verticillium albo-atrum cultures which I happened to obtain about the same time from wilt affected maple trees at Knoxville, Tennessee."

OTHER DISEASES

Alternaria sp. leafspot. Mississippi: loss 1 per cent. Disease becomes more severe following periods of dry weather (Neal).

Diplodia gossypina CKE., boll rot. Texas.

Lightning injury. Mississippi.

Malnutrition, (non-par.) Rust. Louisiana: 7 per cent loss, scattered. Georgia: 5 per cent loss, general, aided by drought. Mississippi: Loss 2 to 3 per cent, occurs more especially in fields which are lacking in organic content and potash (Neal). Tennessee: Loss 2 per cent. Arkansas and North Carolina: reported.

Mycosphaerella gossypina (Cke.) Earle. Leafspot. Texas.

Phymatotrichum omnivorum (Shear) Duggar, root rot. In Texas the disease was severe late in the season, acquiring epidemic proportions, and causing a total loss estimated at 15 per cent (Taubenhaus). It occurred in Arkansas also.

Puccinia hibisciata (Schw.) Kell. rust. Texas.

Recent literature:

1. King, C. J. and H. F. Loomis. Factors influencing the severity of the crazy-top disorder of cotton. U. S. Dept. Agr. Bul. 1484, 21 p. June 1927.

2. Sawhney, A. Studies in the biological and cultural characters of Capnodium sp. on cotton. Jour. Indian Bot. Soc. 5: 141-186. Jan. 1927.

3. Shapovalov, M. The two most common decays of cotton bolls in the southwestern states. Jour. Agr. Res. 35: 307-312. Aug. 15, 1927.
Aspergillus niger, Rhizopus nigricans.

4. Shorbakoff, C. D. A modified method of delinting cotton seed with sulphuric acid. Phytopath. 17: 189-193. March 1927.

5. Woodroof, N. C. Cotton seed treatment by the dusting method. (Abstract). Phytopath. 18: 134. Jan. 1928.

DISEASES OF TOBACCO

WILD FIRE CAUSED BY BACTERIUM TABACUM WOLF & FOSTER

In Maryland, where the total losses were 3 per cent, the wet spring was favorable for seed bed infection. Spraying the seed beds saved them from destruction and greatly reduced the possibilities of later infection by keeping infected plants from the fields, according to Johle. The disease caused no other losses of consequence, but was reported from Massachusetts, Connecticut, New York, Pennsylvania, Virginia, Kentucky, North Carolina, Florida, and Wisconsin.

ANGULAR LEAF SPOT CAUSED BY BACTERIUM ANGULATUM FROMME & MURRAY

This disease, which requires favorable weather conditions for its spread and development, was not serious in 1927. In North Carolina rains spread infection and the loss was 3 per cent. Lehman and Fant state that treatment is becoming a common practice and has had a tendency to reduce the amount of disease. In Maryland the loss was 0.5 per cent. The disease was reported also from Virginia, Tennessee and Kentucky.

BLACK ROOT ROT CAUSED BY THIELAVIA BASICOLA (BERK. & BR.) ZOPF.

The disease was regarded by collaborators generally as less severe in 1927 than is usual. Wisconsin reported 10 per cent loss, mostly in old fields. The loss in Maryland was 0.5 per cent. The disease was reported from Massachusetts, Connecticut, New York, Virginia, and Kentucky.

Recent Literature:

1. Anderson, P. J. Soil reaction and black root rot of tobacco. (Abstract). Phytopath. 18: 131. Jan. 1928.

2. Conant, G. H. Histological studies of resistance in tobacco to Thielavia basicola. Amer. Jour. Bot. 14: 457-480. Oct. 1927.

3. Doran, W. L. Relation of the adjustment of soil reaction to black root-rot of tobacco. Science n. s. 66: 661-662. Dec. 30, 1927.

4. Mandelson, L. F. Black root-rot of tobacco in New South Wales. Thielavia basicola (B. and Br.) Zopf. Agr. Gaz. New South Wales. 38: 523-531. July, 1927.

5. Slagg, C. M., J. E. Montreuil, and T. G. Major. The effects of lime on cigar tobacco. (Abstract). Phytopath. 18: 130-131. Jan. 1928.

MOSAIC (VIRUS)

This serious disease was general over the tobacco-growing sections, but of unequal severity. The total losses estimated are: Wisconsin 10 per cent, North Carolina 8 per cent, Maryland 4 per cent, Georgia 1.5 per cent, Tennessee slight. In seven other states where it was a factor, no losses were given. The comments of several collaborators are of interest.

Massachusetts: Very severe in some fields, causing complete loss; in some fields damage slight; and in others, none. (Doran).

Connecticut: Has been one of the worst mosaic years. (Anderson)

Maryland: Becoming more severe every year. (Johle).

North Carolina: Occurs in all tobacco sections, but especially in Coastal Plain counties. (Fant).

Recent Literature:

1. Blodgett, F. M. Tobacco mosaic on potatoes. Phytopath. 17: 727-734. Oct. 1927.

2. Cook, M. T. The effect of mosaic on the content of the plant cell. Jour. Dept. Agr. Porto Rico. 10: 229-238. July-Oct. 1926. (Sept. 1927).

3. Holmes, Francis O. Accuracy in comparing various concentrations of tobacco-mosaic virus. (Abstract). Phytopath. 18: 132. Jan. 1928.

4. Johnson, J. The classification of plant viruses. Wisconsin Agr. Exp. Sta. Res. Bul. 76. 15 p. 1927.

5. Valleau, W. D., and E. M. Johnson. Experiments and observations on the control of true tobacco mosaic. (Abstract). Phytopath. 18: 132. Jan. 1928.

6. _____ The effect of a strain of tobacco mosaic on the yield and quality of Burley tobacco. Phytopath. 17: 523-527. Aug. 1927.

7. _____ Commercial tobaccos and cured leaf as a source of mosaic disease in tobacco. Phytopath. 17: 513-522. Aug. 1927.

8. Vinson, C. G. Precipitation of the virus of tobacco mosaic. Science n. s. 66: 357-358. Oct. 14, 1927.

OTHER DISEASES

Alternaria sp. leafspot. Georgia, Florida.

Bacterium solanacearum EFS. Bacterial wilt. North Carolina: four per cent loss. Distributed over tobacco growing sections, but most prevalent on soils of the Granville series (Fant). Georgia: slight losses.

Brown root rot (undet.) Connecticut, Wisconsin.

Caconema radicicola (Greef) Cobb, root knot. Georgia: 5 per cent reduction in yield, 20 per cent in grading. General, occurring in middle to late season (Boyd). Severe in Florida and South Carolina.

Cercospora nicotianae, Ell. and Ev., frog-eye. Georgia: 2 per cent loss. Florida.

Corticium vagum Berk. and Curt., damping-off. New Mexico; heavy loss in cold frames (Crawford). Wisconsin: Florida: causing sore shin.

Curly top (undet.). New Mexico: a condition has developed in fields near Albuquerque which has the characteristics of curly top, and which cannot be otherwise identified (Crawford).

Frenching (undet.). Maryland, Wisconsin.

Fusarium affine Fautr. & Lamb., brown spot. Kentucky: this disease was unusually abundant in seed beds. The poor condition of yellow appearing plants was in part due to poor growing conditions in the spring. In yellowed plants in the beds the disease was very injurious, on green healthy plants it is of no importance. Seed treated with hot water (52° for 20 minutes) gave plants fairly free of disease (Valleau).

Fusarium oxysporum nicotianae Johnson, wilt. Maryland.

Phytophthora nicotianae (Speg.) Van Breda de Haan, black shank. Georgia, Florida.

Tobacco - Other Diseases

Ring spot (virus). Connecticut, New York, present. In Maryland, Virginia, Kentucky, it is becoming more severe and an economic problem.

Sclerotium rolfsii Sacc., stem rot. Florida.

White speck (under.) Connecticut.

Starvation. Connecticut. Lack of proper fertilizers and poor weather conditions. (McCormick).

Recent Literature:

1. Doran, W. L. Effect of timothy infusion of different ages on the growth of tobacco and on brown root rot of tobacco. (Abstract). Phytopath. 18: 131-132. Jan. 1928.

2. Fromme, F. D., S. A. Wingard, and C. N. Priode. Ringspot of tobacco: an infectious disease of unknown cause. Phytopath. 17: 321-328. May, 1927.

3. Jochems, S. C. J. Parasitaire stengelverbranding bij Delitabak. (Parasitic stem scorch of Deli tobacco). Meded. Deli Proefst. Medan-Sumatra. II, 49. 35 p. 1927. (English summary p. 34-35. Abst. Rev. Appl. Myc. 6: 754, 1927). Pythium spp.

4. Johnson, James. Further studies on the attenuation of plant viruses. (Abstract). Phytopath. 18: 156. Jan. 1928.

5. Jones, J. P. The influence of cropping systems and fertilizers on black and brown root rot of tobacco. (Abstract). Phytopath. 18: 131. Jan. 1928.

6. McKinney, H. H. Virus diseases observed by the Allison V. Armour Expedition. (Abstract). Phytopath. 18: 155. Jan. 1928.

7. Valleau, W. D. and E. M. Johnson. Some virus diseases of tobacco in Kentucky. (Abstract). Phytopath. 18: 132-133. Jan. 1928.

8. Wingard, S. A. and Fromme, F. D. Tobacco ringspot; a virus disease with a wide host range. (Abstract). Phytopath. 18: 133. Jan. 1928.

DISEASES OF SUGAR CANE

MOSAIC (VIRUS)

Louisiana: Loss 10 per cent. General. Losses are greatly reduced by the increasing use of resistant varieties. Cayana 10 is immune; P. O. J. 213 is very resistant; P. O. J. 234 and P. O. J. 36 are resistant; Purple, striped, and D. 74 are susceptible. (Tims).

Mississippi: loss 15 per cent. The disease is serious in all counties south of the A. & V. railroad, or nearly one-half the area in the state with severe damage in some sections. (Neal).

Recent Literature:

1. Cook, M. T. Photo-synthesis of the sugar cane mosaic plant Jour. Dept. Agr. Porto Rico 10: 239-242. July-Oct. 1926 (Sept. 1927).

2. _____ The effect of mosaic on the content of the plant cell. Jour. Dept. Agr. Porto Rico. 10: 229-238. July -Oct., 1926. (Sept. 1927).

3. Cross, Wm. E. The P. O. J. canes in Louisiana. Reasons for recommending those varieties as means of restoring industry set forth. - Tucuman's parallel case. Facts About Sugar 22: 1230-1231, 1235. Dec. 17, 1927.

4. Edgerton, C. W. and E. C. Tims. Investigations on the sugar cane diseases situation in 1925 and 1926. Louisiana Agr. Exp. Sta. Bul. 197. 50 p. 1927.

5. Rands, R. D. and S. F. Sherwood. Yield tests of disease-resistant sugar canes in Louisiana. U. S. Dept. of Agr. Cir. 418. 20 p. 1927.

6. Reyes, G. M. The mosaic disease of sugar cane. Philippine Agr. Rev. 20: 187-228. 1927.

7. Verret, J. A. Losses from mosaic. Kohala sugar company, experiment no. 1. Hawaiian Plant. Rec. 31: 244-245. July, 1927.

OTHER DISEASES

Colletotrichum falcatum Went., red rot. Louisiana: 5 per cent loss; worse in some sections than ever noted before. (Tims). Mississippi: 1 per cent loss. Florida: present.

Sugar Cane - Other Diseases

Helminthosporium sacchari Butl., eye leafspot. Louisiana: Trace. An unusually heavy infection on D 74 and Purple near Baton Rouge. (Tims).

Phytomonas sp., red stripe. Louisiana: reported for the first time (Tims).

Root rot (undet.) Louisiana: loss 10 per cent. General.

Recent Literature:

1. Barnum, Clyde C. Progress report on root rot investigations. Rept. Ann. Meeting Assoc. Hawaiian Sugar Technol. 6: 37-40. 1927.

2. Cook, M. T. The eye-spot disease of sugar cane. Jour. Dept. Agr. Porto Rico 10: 207-227. July-Oct. 1926. (Sept. 1927).

3. _____ The gummosis of sugar cane. (Abstract). Phytopath. 18: 135. Jan. 1928.

4. Drechsler, Charles. A species of Helminthosporium distinct from Helminthosporium sacchari, causing brown stripe of sugar cane. (Abstract). Phytopath. 18: 135-136. Jan. 1928.
   H. stenospilum.

5. Earle, F. S. Sugar cane and its culture. Facts About Sugar 22: various nos. 1927.

6. Edgerton, C. W., and E. C. Tims. Investigations on the sugar cane disease situation in 1925 and 1926. - Louisiana Agr. Exp. Sta. Bul. 197. 50 p. 1927.

7. Faris, James A. Brown stripe of sugar cane in Cuba. (Abstract). Phytopath. 18: 135. Jan. 1928.

8. _____ Sugar cane eye spot in Cuba. (Abstract). Phytopath. 18: 135. Jan. 1928.

9. _____ Zonate foot rot of sugar cane. Phytopath. 17: 83-94. Feb. 1927.
   Fomes sp.

10. _____ Field control of sugar cane root disease conditions. Bul. Trop. Plant Res. Found. 6. 16 p. 1927.

11. Faris, J. A., and R. V. Allison. Sugar cane root disease in Cuba. A progress report upon the root disease situation in 1925. Phytopath. 17: 61-82. 1927.

12. Lee, H. A., C. C. Barnum, D. M. Weller, and C. W. Carpenter. Progress report of the Pythium root rot phase of the Lahaina growth failure problem. Rept. Assoc. Hawaiian Sugar Technol. 6: 16-21. 1927.

13. Lee, H. A. and Martin, J. B. More effective dust fungicides by the use of oxidizing agents with sulfur. Industr. & Engin. Chem. 20: 23-28. Jan. 1928.

14. _____ The development of more effective dust fungicides by adding oxidizing agents to sulphur. Science n. s. 66: 178. Aug. 19, 1927.

15. Lyon, J. L. The effect of potash fertilizers on eye-spot at the Waimanalo Sugar Company. Hawaiian Plant. Rec. 31: 284-287. July, 1927.

16. _____ The susceptibility to eyespot of H 109 ratoons as compared with plant cane. Hawaiian Plant. Rec. 31: 296-299. July, 1927.

17. _____ The effect of frequency of irrigation applications on eyespot at the Lihue Plantation Company, Ltd. Hawaiian Plant. Rec. 31: 292-296. July 1927.

18. North, D. S. Leaf-scald, a bacterial disease of the sugar cane. Intern. Sugar Jour. 29: 151-154. March 1927.

19. Rands, R. D., and S. F. Sherwood. Yield tests of disease-resistant sugar canes in Louisiana. U. S. Dept. Agr. Circ. 418. 19 p. June 1927.

20. Sartoris, G. B. A cytological study of Ceratostomella adiposum (Butl.) comb. nov., the black-rot fungus of sugar cane. Jour. Agr. Res. 35: 577-585. Oct. 1, 1927.

21. Tims, E. C. and P. J. Mills. Some fungi associated with the root disease of sugar cane in Louisiana. Reference Book Sugar Ind. World (Louisiana Planter) 5 (5): 33-37. July, 1927.

DISEASES OF SUGAR BEET

CURLY TOP (VIRUS)

Although curly top in Utah was late in developing it caused severe damage, resulting in a loss of 15 per cent. In California the loss was 2 per cent. In Idaho, where the disease is usually severe, only a trace is reported. Curly top seemed to be more prevalent than usual in New Mexico. The disease prevents commercial culture of sugar beets in many sections of Oregon, according to McKay.

Severin and Severin (9) report that curly top was found to occur, on rare occasions, in beet fields in the west central part of South Dakota. The leaf hopper was not found.

Sugar Beet - Curly Top

According to Fawcett (5) curly top in the Argentine is not the same as the curly top of North America. It is transmitted by Agallia stictlcollis, not by Eutettix tenella, which has not been found to occur in the Argentine.

Recent Literature:

1. Böning, Karl. Die kalifornische Blattrollkrankheit der Rübe (curly-top). Sammelreferat der wichtigsten nordamerikanischen Arbeiten. Centralbl. Bakt. Abt. II, 72: 379-398. Nov. 1927.

2. Carter, W. A technic for use with homopterous vectors of plant disease, with special reference to the sugar-beet leaf hopper, Eutettix tenellus (Baker). Journ. Agr. Res. 34: 449-451. Mar. 1, 1927.

3. _____ Extensions of the known range of Entettix tenellus Baker and curly-top of sugar beets. Jour. Econ. Entom. 20: 714-717. 1927.

4. Davis, E. W. Notes on collections of the sugar beet leaf-hopper showing the extension of its known range into British Columbia and to the coast in Washington and Oregon. Jour. Econ. Entom. 20: 581-586. 1927.

5. Fawcett, G. L. The curly top of sugar beet in the Argentine. Phytopath. 17: 407-408. June, 1927.

6. Haegele, R. W. The beet leafhopper (Eutettix tenellus Baker): A survey in Idaho. Idaho Agr. Exp. Sta. Bul. 156. 28 p. 1927.

7. Knowlton, G. F. The beet leafhopper and curly-top situation in Utah. Utah. Agr. Exp. Stat. Circ. 65. 12 p. May, 1927.

8. Severin, H. H. P. Crops naturally infected with sugar beet curly-top. Science n. s. 66: 137-138. Aug. 5, 1927.

9. _____ and H. C. Curly-top of sugar beets in South Dakota. Journ. Econ. Entom. 20: 586-588. Aug. 1927.

OTHER DISEASES

Corticium vagum Berk. & Curt., root rot. Louisiana, less severe than usual, but causing 4 per cent loss (Tims. Florida, damping-off. Utah, Idaho, dry-rot canker, causing some loss.

Sugar Beet - Other Diseases

Cercospora beticola Sacc., leaf spot. Colorado, causing appreciable losses. Iowa, 1 per cent loss. Reported from Louisiana, Utah, and California.

Mosaic (virus). New Mexico, Utah.

Heterodera schachtii Schmidt, nematode. Colorado, general, trace.

Phoma betae (Oud.) Frank, root rot and leaf spot. Louisiana and Oregon report its occurrence as a leaf spot. In Idaho it caused a damping-off. Reported also from Wisconsin, Utah and Iowa.

Sclerotium rolfsii Sacc., stem rot. Louisiana, general, 6 per cent loss.

Uromyces betae (Pers.) Lév., rust. California.

Recent Literature:

1. Böning, K. Die Mosaikkrankheit der Rübe. Forsch. Gebiet Pflanzenkr. & Immunitat Pflanzenkr. 3: 81-128. 1927.

2. Coons, G. H., and D. Stewart. Prevention of seedling diseases of sugar beets. Phytopath. 17: 259-296. May, 1927.

3. Drechsler, Charles. The occurrence of Aphanomyces cochlioides n. sp. on sugar beets in the United States (Abstract). Phytopath. 18: 149. Jan. 1928. Michigan.

4. Goffart, H. Versuche zur Bekämpfung der Rübennematoden (Heterodera schachtii Schm.) mit calciumcyanid. Arb. Biol. Reichsanst. Land. u. Forstw. 15: 249-259. 1927.

5. Molz, E. Zur frage des Geschlechtsverhältnisses des rübennematoden Heterodera schachtii. Zeitschr. Pflanzenkr. 37: 260-266. 1927.

6. Schaffnit, E., and H. Weber. Über das Vorkommen von intrazellularen Körpern in den Geweben mosaikkranker Rüben. Forsch. Gebiet Pflanzenkr. & Immutität Pflanzenr. 4: 23-42. 1927.

7. Thorne, G. The life history, habits, and economic importance of some mononchs. Journ. Agr. Research 34: 265-286. 1927.

DISEASES OF OTHER CROPS

ASPARAGUS

Cercospora asparagi Sacc., leafspot. Texas, Missouri.

Cercospora caulicola Wint., leafspot. Florida.

Colletotrichum sp., anthracnose. Virginia.

Fasciation (undet.) New Jersey.

Fusarium sp., wilt, New Jersey. Root rot, Missouri: Crowns of plants at one nursery badly rotted with internal browning; roots dry with bark remaining, internal tissues decomposed. Some evidence that Fusarium may be the primary cause. (Scott)

Puccinia asparagi DC., rust. Slight losses in Pennsylvania, Wisconsin, Minnesota, Iowa, South Dakota. Also reported from New York, Delaware, Virginia, Michigan, New Mexico, California. Old plantings, non-resistant varieties usually affected.

Canker (undet.) South Carolina.

BEETS, GARDEN

Actinomyces scabies (Thax.) Guss., scab. New Jersey, Minnesota.

Bacterium tumefaciens EFS. & Town., crowngall. New Jersey.

Caconema radicicola (Greef) Cobb, rootknot. Florida, Texas.

Cercospora beticola Sacc., leafspot. Caused 0.5 per cent loss in Maryland, and loss than 1 per cent loss in New York. Twenty-one other states report the presence of the disease, but regard it of little importance.

Corticium vagum Berk. & Curt., root rot. Virginia.

Mosaic (undet.) Utah.

Phoma betae (Oud.) Frank. Connecticut.

CARROT

Alternaria sp. New York, black rot. Louisiana, leafblight severe.

Bacillus carotovorus Jones, soft rot. New York, 2.5 per cent loss. New Jersey, heavy loss in storage at Vineland, Iowa, Michigan.

Caconema radicicola (Greef) Cobb. Oregon, severe in canning carrots. Utah, loss 6 per cent.

Cercospora apii carotae Pass., leaf spot. New York, 4 per cent loss. Indiana, Iowa.

Corticium vagum Berk. & Curt., stem rot. New York.

Curly top (Undet.) Utah.

Macrosporium carotae Ell. & Langl., leaf blight. New York, New Jersey, Florida, California.

Rhizoctonia crocorum (Pers.) DC., violet root-rot. Oregon, local, 0.3 per cent.

Sclerotium rolfsii Sacc. Florida, Texas.

C A S T O R B E A N

Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.

D I L L

Cercospora anethi Sacc., leaf spot. Iowa. First report for State. Severe infections found in two sections (Archer).

E G G P L A N T

Bactorium solanacearum EFS., bacterial wilt. Virginia, South Carolina, Ohio.

Botrytis cinerea Auct., gray mold rot. New Jersey.

Corticium vagum Bork. & Curt., damping-off. New York, New Jersey, Virginia.

Macrosporium sp., leafspot. Virginia.

Mosaic (undet.) Virginia, Texas.

Phomopsis vexans (Sacc. & Syd.) Harter, leafspot. Virginia, New Jersey, Texas, Iowa.

Phymatotrichum omnivorum (Shear) Dug., root rot. Texas, severe in spring and fall crops in lower valley. (Bach)

Sclerotium rolfsii Sacc., stem rot. Virginia; unusually active, causing damping-off. (McWhorter)

Verticillium albo-atrum Reinke & Berth., wilt. New York, losses 30 to 50 per cent. Few eggplants grown in the state because of this disease. Black Beauty most susceptible. (Chupp). New Jersey, Mississippi, Utah.

E N D I V E

Yellows (?). New York. In Nassau County a number of varieties are grown for greens. They have a serious disease of unknown origin, which resembles the yellows of lettuce. (Chupp).

E S C A R O L L E

Sclerotinia sclerotiorum (Lib.) Massee, drop. Florida.

F E N N E L

Botrytis sp., New York. In Nassau County a large amount of fennel is grown. This has almost no diseases. The tarnished plant bug stings the tender shoots, which die, and some of these are later invaded by Botrytis. The plants are not injured commercially. (Chupp).

G I N S E N G

Alternaria sp. Pennsylvania, caused considerable trouble to a few growers who planted the crop on natural forest land. (Thornton).

Phytophthora cactorum (Leb. & Cohn.) Schroet., rot. Indiana.

L E E K

Macrosporium sarcinula parasiticum Thuem., black stalk rot. Florida.

M A N G E L W U R Z E L

Phoma betae (Oud.) Frank, root rot. Washington.

Recent Literature:

1. Millard, W. A., & F. Bewley. Mangel scab.-- Its cause and histogeny. Ann. Appl. Biol. 14: 296-311. Aug. 1927.

O K R A

Alternaria sp. Utah.

Caconema radicicola (Greef) Cobb, root knot. Texas, 1 per cent loss.

Fusarium vasinfectum Atk., wilt. Texas.

Phymatotrichum omnivorum (Shear) Dug., root rot. Texas, 15 per cent loss.

Rhizoctonia sp., root rot. Texas.

Sclerotinia sclerotiorum (Lib.) Massee, drop. Massachusetts.

Verticillium albo-atrum, Reinke & Berth., wilt. New Jersey, general in a few okra growing sections. Loss in acid soil (Haenseler).

P A R S L E Y

Fusarium sp., wilt. Virginia.

Sclerotinia sclerotorium (Lib.) Massee, Virginia.

Septoria sp., leaf blight. New York, trace.

P A R S N I P

Cercospora apii pastinacae Farl., leaf spot. Connecticut, New York, Indiana, Iowa, Utah.

P E A N U T

Cercospora personata (Berk. & Curt.) Ell. & Ev., leaf spot. Louisiana.

Chlorosis. Too much lime. Texas.

Other Crops - Diseases.

Phymatotrichum ormivorum (Shear) Dug., root rot. Texas.

Rhizoctonia sp., root rot. Georgia.

Sclerotium rolfsii Sacc., stem rot. Virginia, Mississippi, Texas.

P E P P E R

Alternaria sp., fruit rot. Iowa, first report.

Bacterium solanacearum EFS., bacterial wilt. South Carolina, Florida, Texas.

Bacterium vesicatorium Doidge, bacterial spot. New Jersey.

Bacterial soft rot. New York (Suffolk), 25 per cent loss on cheese popper. (Lindon).

Botrytis sp., gray mold. New Jersey.

Cercospora capsici Heald & Wolf, leaf spot. Florida, Texas.

Corticium vagum Bork. & Curt., damping-off. New York, New Jersey.

Curly top (virus), Oregon, 2 per cent loss. New Mexico, present.

Fusarium sp., wilt. Iowa, in one garden (Archer).

Glomerella sp., anthracnose. Texas, 1 per cent loss.

Mosaic (virus). Connecticut, New York, New Jersey, Virginia, Indiana.

Phyllosticta sp., leaf spot. Virginia.

Phymatotrichum ormivorum (Shear) Dug., root rot. Texas, 1 per cent loss.

Phytophthora capsici Leonian, blight. New Mexico, serious on chili pepper. (Crawford).

Sclerotinia sclerotiorum (Lib.) Massee, damping-off. Florida.

Sclerotium rolfsii Sacc., stem rot. Florida.

Sunscald (non-par.). Utah, makes infection by various organisms possible. (Linford).

RHUBARB

Ascochyta rhoi Ell. & Ev., leafspot. Connecticut, Missouri.

Caconema radicicola (Greef) Cobb, rootknot. Utah.

Phyllosticta straminella Bres., leafspot. New York, New Jersey, and Utah for the first time.

Root rot (cause undet.) Utah, possibly a Phytophthora.

ROSELLE

Phymatotrichum omnivorum (Shear) Dug., root rot. Texas. Probably a new host. (Bach).

SALSIFY

Albugo tragopogonis (DC.) Gray, white rust. New York, statewide, loss slight to 1 per cent. Present in Virginia, Indiana, Colorado.

Yellows (unknown). New York. Rather common on Long Island. The plants have many more leaves than normally. These leaves are much shorter and thinner than usual, and are almost colorless. (Chupp).

SOUR GRASS OR SCHAFF (RUMEX ACETOSA)

Gloeosporium rumicis, leaf spot. New York, Nassau County. Occurs in places to such an extent that the grass is hardly marketable. (Chupp).

SPINACH

Collototrichum spinaciae Ell. & Halst., anthracnose. Texas, 1 per cent loss.

Curly top (virus). Utah.

Fusarium sp., wilt. Texas.

Heterosporium variabile Cke., leafspot. Virginia, less than usual. (McWhorter).

Mosaic (virus). Maryland, 1 per cent loss. Slight loss in Massachusetts. Reported from Virginia, Kentucky, North Carolina, Indiana, and from Iowa for the first time.

Phyllosticta chenopodii Sacc., leafspot. New York.

SWISS CHARD

Cercospora beticola Sacc., leafspot. Texas, Indiana, Iowa.

TEASEL

Tylenchus dipsaci (Kuehn) Bast., stem nematode. Oregon: Losses 50 per cent locally. The disease has been present locally for 30 years or more, but the cause has just recently been definitely recognized (McKay).

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